FISHERIES ANNUAL REPORT

OF THE MINISTER FOR THE MARINE FOR 1986

FISHERIES

REPORT FOR

1986

ROINN NA MARA
(Department of the Marine)

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CONTENTS

INTRODUCTION

The fishing industry continued to expand in 1986. Landings of sea fish valued at £64 million set new records representing a 10% increase in value over 1985. Exports were valued at £105 million and the top port was Killybegs earning over £13 million, with mackerel the top species.

Increases in catch were recorded in all the main categories of marine fin fish and shellfish. Scientific observations indicated a recovery of the Celtic Sea herring stock from its period of decline. A major innovation in marine research was the sponsoring by the industry of a mackerel egg survey, designed to calculate the size of the adult mackerel stock. The surveys results, together with routine sampling, indicate significant changes in the habits of mackerel and the movement of shoals which will effect the basis of management plans.

Salmon landings were 43% higher than the average figure for the previous ten years, with increases being noted both in the drift net fishery and in the rod fishery. Evidence both from national and from international scientific observations was that the survival of salmon in the Atlantic proved better in 1986 than in previous years and this, allied to the protection work undertaken through the Department, explains this very satisfactory turn of events.

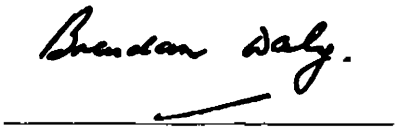
While the healthy state of the salmon stocks was a welcome respite from recent years of poor fishing, serious concern continues about the maintenance of the salmon industry. A small group of experts was therefore established to make a detailed review of the situation and to make recommendations for improvement in the management system.

The development of the aquaculture industry has been spectacular: the produce of salmon cage farming increased by 44% to £4.5 million and mussel culture shows steady growth. Progress in the legal designation of areas for aquaculture is being made, with eleven areas now designated and eleven more under consideration.

Pollution was a problem area the most alarming aspect of which was the increasing number of fish kills, particularly those associated with agricultural effluents, potentially much more difficult to combat than pollution from specific sources.

The contribution by the State to the fishing industry, excluding the cost of administration and of research conducted by Fisheries Division was £11.8 million for sea fisheries and £5.7 million for salmon and inland fisheries.

In the course of 1986 the Department was given responsibility for Tourism and renamed the Department of Tourism, Fisheries and Forestry.

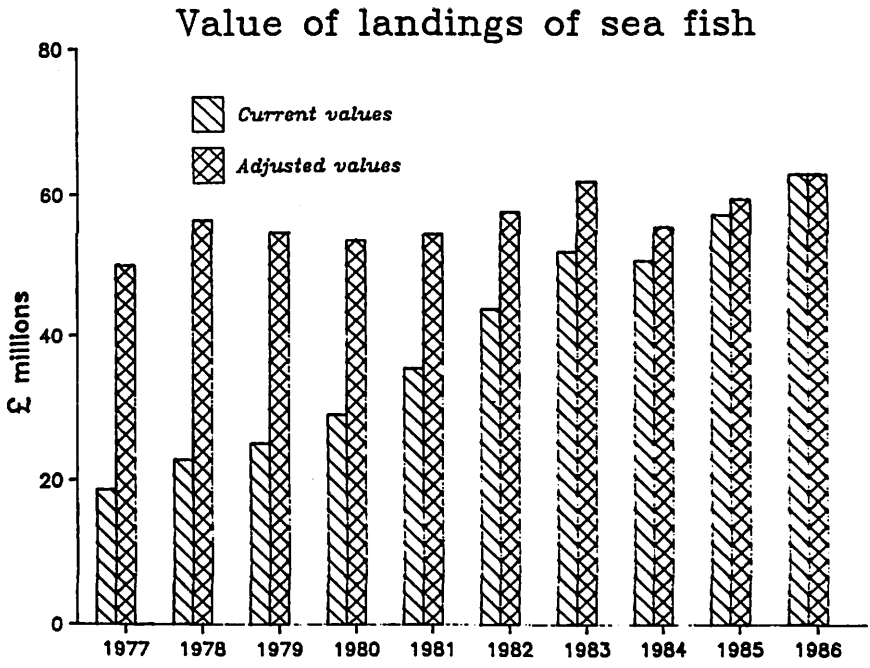


Brendan Daly, T.D.
Minister for the Marine

1. THE FISHING INDUSTRY

Landings

In 1986 the total value of all sea-fish landings (excluding salmon) increased by 10% on the record figure for 1985 to £64 million. The total quantity landed amounted to 223,492 tonnes of which 193,673 tonnes were landed at Irish ports. Details of the landings of the most important fish and shellfish species are given in Appendix 1. Mackerel, nephrops, herring and cod were the top species, accounting for 42% of the total value.



Total landings of sea fish: current value and value adjusted according to CPI base November 1975.

Five ports recorded landings worth more than £2 million. Killybegs was the top earner at £12.6 million, the next Howth at £6.7 million, followed by Castletownbere, Dunmore East and Rossaveal. Details of landings at the major ports are given in Appendix 3.

Exports and imports

At £105 million exports of fish products, including both sea and freshwater preparations, continued to establish new records, with an increase in value of £2 million over 1985.

	Tonnes	£'000
Fresh, frozen or salted fish and shellfish	140,034	92,318
Prepared or preserved fish and shellfish	1,494	2,124
Fishmeal and fish oils	6,022	1,120
Foreign landings (including transhipment at sea)	29,819	6,881
Total	177,369	104,259

There was no significant change in the value of imports.

Imports	Tonnes	£'000
Fresh, frozen or salted	16,148	14,354
Prepared or preserved, including canned	7,871	18,753
Fishmeal	11,888	4,593
Total	35,902	37,700

Details of exports and imports are given in Appendix 4.

Fish quality control

Departmental regulations introduced in 1979 require vessels engaged in fishing to be maintained in a clean and hygienic condition. Fish brought on board must be washed, sorted and boxed in ice or stored in chilled sea water tanks. On landing the fish must be protected from the elements and kept at a temperature not exceeding 2°C until final sale has been completed. Premises used for the processing of fish and equipment used in processing must similarly be kept clean and these conditions also apply to retail premises. Regulations for shellfish are much the same except for modification in the provisions relating to the use of ice. Molluscs are not permitted to come into direct contact with ice and must be kept at a temperature below 10° but not less than 2°C.

Inspection of vessels and processing and marketing premises is carried out by Sea Fishery Officers and Fish Quality Officers. Seven Sea Fishery Officers are based at Dublin (2), Youghal, Tralee, Galway, Ballyshannon and Killybegs. The Fish Quality Officers are deployed at Dublin (2), Waterford, Cork, Bantry, Dingle, Galway, Achill and Killybegs (3). The Sea Fishery Officer in Killybegs in 1986 was on special leave as a Fishery Inspector with the EEC and replaced by an acting Officer.

A comprehensive review of the Department's needs in the area of fish quality was initiated in the latter part of 1986. It is expected to lead to significant improvement in standards and practices.

FISHERY HARBOUR DEVELOPMENT

Fishery harbour centres

At Killybegs work commenced on the provision of a boatlift capable of raising boats up to 36 metres long and weighing up to 800 tonnes. The cost of the project is estimated at £2.6 million and is expected to take three years to complete. Resurfacing of the roadway in the vicinity of the auction-hall and service quay was carried out. Total expenditure on development work at the harbour during the year was £226,000.

Improved lighting to serve the boatlift and boatyard areas was provided at Castletownbere. For safety reasons a concrete kerbing was provided around the transverser bay in the boatyard. Work on the provision of a net and gear storage compound was well under way by the end of the year. Expenditure on development work amounted to £33,000 for the year.

On 23rd August the new fishing facilities at Howth Harbour were officially opened. Final adjustments were made to transverser gear in the boatyard which became fully operational towards the end of the year. The total expenditure on development works at Howth to the 31st December 1986 was £11,514,716.

A fish processing factory was opened on a site leased to two companies on the Department's industrial estate at Dinish Island and new oil-bunkering facilities were installed by Conoco Ltd. to service the Dinish Island wharf. The extension and improvement of Schull pier proceeded on schedule and within budget. It will be completed in 1987 to provide over 60 metres of extra berthage together with better slipping and general ancillary facilities. The total cost will be approximately £670,000.

Work commenced on a £3¼ million improvement scheme designed to triple the accommodation of the fishing port at Greencastle and to provide improved onshore facilities for fishery related services. In 1986 £267,000 was spent on the project. A revised development plan for Rossaveal was agreed by the advisory committee and an economic appraisal initiated. The total expenditure on all harbour works in 1986 was £1,194,503.

Grant-aided harbour improvement works

Fishery harbour improvement works, grant-aided by the Department of Fisheries and Forestry, were completed during the year at Scraggane, Brandon and Caherciveen, Co. Kerry; Knockadoon and Youghal, Co. Cork; Doonbeg, Co. Clare; Killala, Co. Mayo; Ballysaggart and Kellultan, Co. Donegal; Clogherhead, Co. Louth; Arklow, Co. Wicklow; and at Duncannon and Blackwater, Co. Wexford. Work was in progress at the end of the year at Ballyglass, Purteen, Blacksod and Kilcummin, Co. Mayo; and at Derryinver, Co. Galway.

Improvement works recommended by the Department and was financed by Roinn na Gaeltachta were completed during the year at Inishboffin, Camus More (Tory Island), Bunaniver, Leac Dubh (Aranmore), Co. Donegal; Rinn Roe, Co. Mayo; Kilkieran, Co. Galway; while works were in progress at Achill Beg and Cill Damhnait, Co. Mayo; Dingle, Co. Kerry; and Clear Island, Co. Cork.

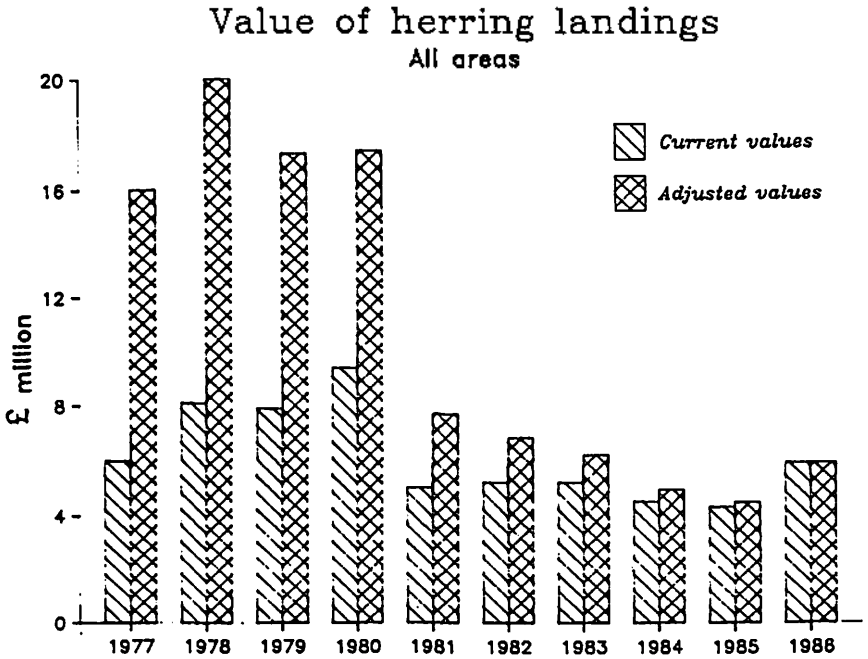
Sea fisheries protection

Regular inspection patrols of the 200 mile fishery zone were carried out by the Naval Service in conjunction with the Air Corps during 1986 to ensure compliance with EEC and national measures for the protection and control of sea fisheries. As a result of these patrols a total of 49 fishing vessels were detained for suspected breaches of the Fisheries Acts. Of these, eleven skippers were convicted with fines and forfeitures amounting to £197,620. Three were released due to lack of sufficient evidence, five received official warnings and the remaining thirty cases were still sub-judice at the end of the year. Various infringements were involved including breaches of EEC Regulations governing quotas and technical conservation measures, infringements of EEC Logbook Regulations, illegal entry of the fisheries limits, illegal fishing and attempted illegal fishing.

2. MARINE CAPTURE FISHERIES

Herring

Landings of herring increased by 28% to 38,020 tonnes. The value of the catch, £5.9 million, placed herring third in the rank of species in the sea fisheries, following mackerel and nephrops. The price per tonne also increased. Killybegs was the top port (Appendix 5).



Herring exports in 1986 increased by 54% over the 1985 figure. Total herring exports were valued at £17.1 million in 1986 compared with £11.1 million in 1985. The most significant growth area was exports of frozen herring now valued at £4.5 million to Japan.

Herring exports 1985 and 1986	Tonnes		£'000	
	1985	1986	1985	1986
By commodity				
Fresh, chilled or frozen	12,138	16,555	3,904	5,694
Salted or smoked	10,961	9,643	5,884	5,898
Prepared or preserved including herring roe	764	1,622	1,389	5,578
Main herring exports by country:				
Federal Republic of Germany	5,775	11,010	3,977	5,976
France	4,765	3,481	2,001	1,424
United Kingdom	1,302	1,921	1,129	1,585
USSR	1,794	1,550	287	295
The Netherlands	1,462	1,501	599	655
Japan	638	1,252	1,468	5,549

Stock assessment of herring was based on sampling in three regions: Celtic Sea/VIIj, Donegal-Galway (VIa South and VIIb) and the Irish Sea (VIIa). A larval survey was made in October and November for the Donegal-Galway fishery. Young herring surveys in February took place in the Irish Sea. A total of 16,078 commercially caught herring were measured and 3,624 of these were aged as well. Details of the results were presented at the ICES Herring Working Group.

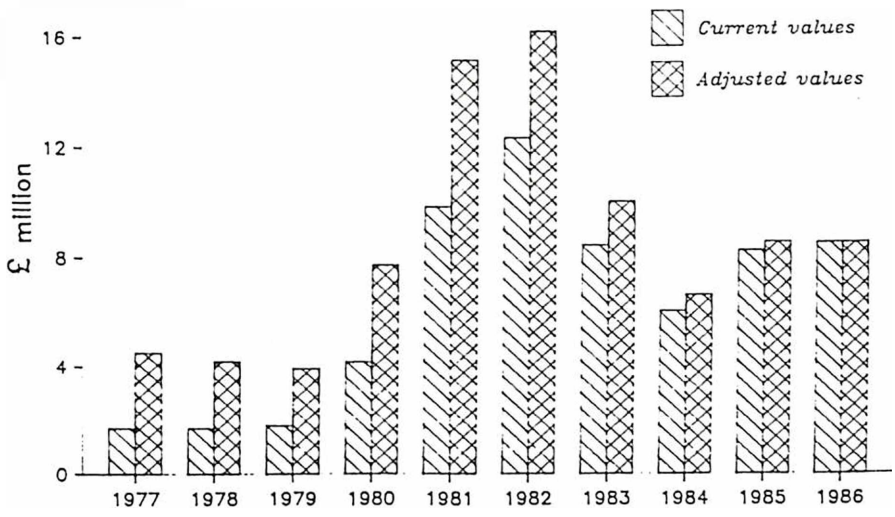
The assessments showed that the stock in the Celtic Sea/VIIj area had recovered and had returned to the levels of the mid-1950's. This recovery resulted from a number of very successful breeding seasons and a high survival of young which had begun to enter the fishery. The total stock at the end of 1986 was estimated to be over 100,000 tonnes and the long-term annual yield should be 15,000 to 20,000 tonnes.

The condition of the west coast of Irish Sea herring stocks was not so satisfactory. Although the west coast larval surveys showed an improvement in the size of the spawning stock following a sharp decline in 1985, the stock remained at a low level. The fishing effort in the Irish Sea had increased rapidly in 1985, leading to a sharp decline in the total stock. Catches fell in 1986 and fishing effort was reduced accordingly.

Mackerel

The value of mackerel landed at Irish ports was £6.6 million. This figure does not include the part of the catch transhipped at sea, worth £1.8 million. The total establishes mackerel as the most valuable species in the capture fisheries. By far the greatest landings were made at Killybegs where the value was over £5 million with Rathmullen second in importance, leaving ports to the south far behind (Appendix 5).

Value of mackerel landings
(Including trans-shipments at sea)



Mackerel exports valued at £19 million in 1986 showed a substantial reduction on the 1985 figure mainly due to currency difficulties in the Nigerian market. The exports to the Netherlands increased to nearly double the previous year's earnings.

	Tonnes		£'000	
Mackeral exports 1985 and 1986	1985	1986	1985	1986
Fresh, chilled or frozen	82,538	64,121	31,520	18,666
Principal Importers				
Nigeria	31,028	10,718	15,024	3,347
Egypt	9,892	5,372	3,693	1,670
Netherlands	8,412	15,173	2,088	3,328
France	8,086	5,830	2,924	2,117
Federal Republic of Germany	5,588	3,773	2,753	1,786
United Kingdom	3,182	3,986	1,038	1,086

A major innovation in the stock assessment work was an egg survey, partly financed by the industry and executed under the direction of Department scientists, in a region to the north west of Ireland and west of Scotland. A young mackerel survey on the west coast in November was severely hampered by bad weather. In routine sampling of the commercial catch, 5,047 fish were measured of which 1,805 were aged. Details of the results were presented to the ICES Working Groups.

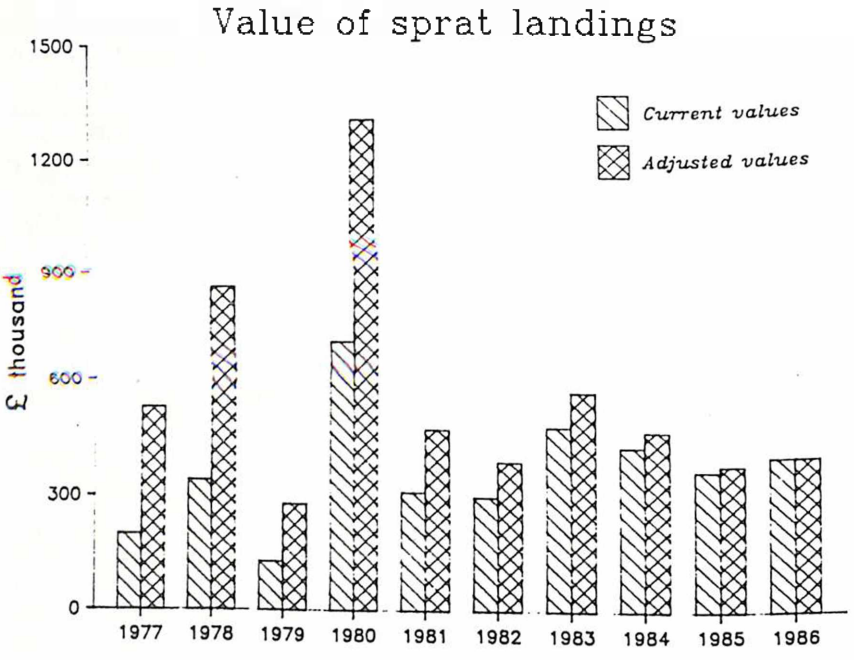
The results of the sampling programme indicated that the 1984 year

class was the strongest to have entered the fishery for some time. International egg surveys in Division VII and VIII (off the south and southwest coasts) showed that the spawning stock biomass was continuing to decrease. However, this trend was expected to be reversed when the 1984 year class spawned for the time. The egg survey financed by the industry showed that a minimum of about 100,000 tonnes of mackerel spawned to the north of Ireland and west of Scotland, compared to about 1.7 million tonnes in Divisions VII and VIII.

The location and distribution of the mackerel fisheries have changed dramatically in recent years, and this has created considerable difficulties in estimating stock sizes.

Sprat and horse mackerel

The sprat fishery represents a small, but important, source of income totalling £1 million for a number of boats along the south coast in winter. A total of 1,676 specimens were examined in January, November and March to provide the trade with information on the size and fat content of the fish. Horse mackerel were sampled from landings at Killybegs in late summer and autumn. As with the sprat, these were used to provide the trade with information about quality.



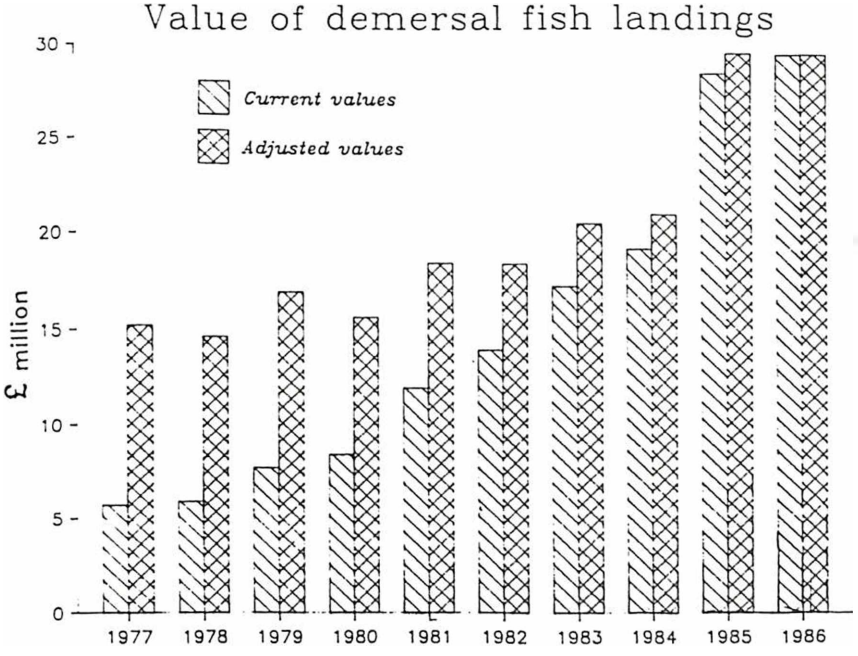
Total landings of sprat: current value and value adjusted according to CPI base November 1975.

There has been a very significant increase in the value and quality of horse mackerel landings in recent years mainly because of increased market outlets to Japan. The value of the catch increased from £1.3 to £2.3 million.

Demersal fish

The first sale value of demersal fish landings increased by almost £1 million, to over £29 million in 1986. This took place in spite of a decrease of 17 per cent in the tonnage landed. The fall in catch was observed for most of the important species, although megrim and hake yields increased. Details of catches and value are given in Appendix 1. Whiting remained the top round fish and plaice the most important flat fish by weight. The top five species by value were cod, hake, monkfish, whiting and megrim which lay just ahead of plaice and sole. Each of these seven had a catch value greater than £2 million and together accounted for 70 per cent of the value of the demersal fish.

The decline in quantities of these fish caught may be attributed to bad weather at the beginning and end of the year. The maintenance of the value of the catch, in spite of this, owes much to the developing trend for Irish boats to land their fish at foreign ports when these offer better prices.



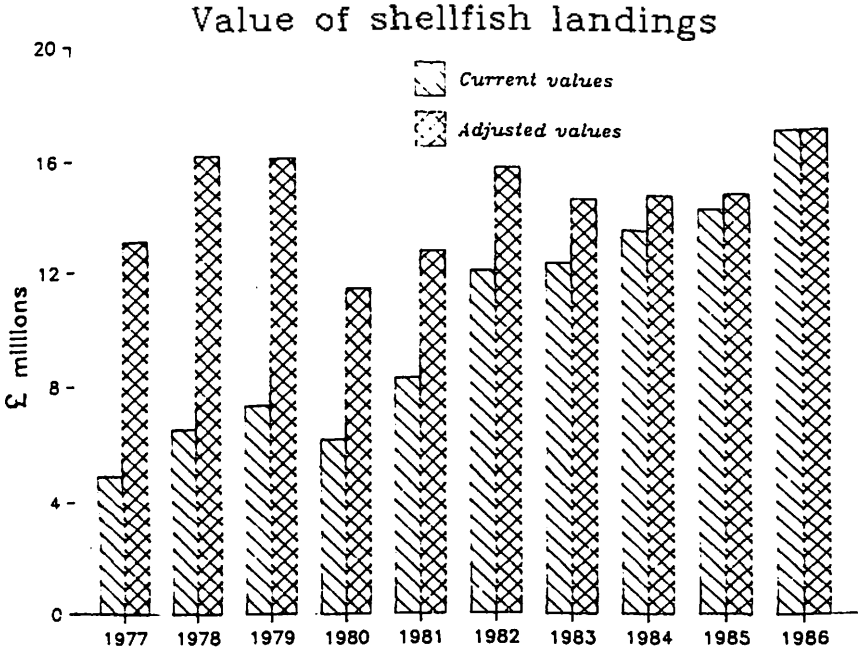
Total landings of demersal fish: current value and value adjusted according to CPI base November 1975.

Stock assessment during the year was based on the examination of specimens from the commercial landings: a total of 83,384 fish were sampled. Important progress in the handling of the specimens sampled has been made by the introduction to otolith sectioning equipment and by the computerisation of sample data.

Shellfish

The value of the shellfish catch showed a substantial increase from £14.4 to £17.4 million. This was brought about largely by a marked improvement in the landings of the species caught by the larger boats using trawling or dredging gear. The fisheries for *Nephrops* (Dublin Bay prawns) and for escallop both increased over 1985. Squid catches rose spectacularly from 275 to 730 tonnes. This catch, however, appears to be based on a single year class and is likely to fluctuate.

The other notable increase was listed under "other molluscs" which rose from 90 tonnes to 238 tonnes. This is largely explained by the revival of the whelk fishery in the Irish Sea. Developments in the fishery for mussels, oysters and escallops are treated under "Aquaculture" on page ??



Total landings of shellfish: current value and value adjusted according to CPI base November 1975.

The Shellfish Sanitation Programme which was introduced in 1985 was continued and expanded in 1986. It now covers some 16 areas in

which molluscs are grown, and the coverage will be further expanded in 1987. The scheme is designed to meet import regulations in major European and American markets and to consolidate and boost our export trade.

Nephrops

Nephrops, the Dublin Bay prawn, for the first time on record was the most valuable species actually landed in Irish Ports, having increased from £5 million to £7.4 million.

Samples were taken totalling 18,000 from the Irish Sea, 5,300 from the Porcupine Bank and 1,200 from Galway Bay off Spiddal. A major computer-based study of sample data going back to 1969 has been initiated. When completed, greatly improved knowledge of the population structure will be available, allowing major developments in the effective management of the stocks.

Micro-tagging has continued and 4,000 individuals were tagged and released off Lambay Island in August, the area chosen being one where commercial fishing is limited. The prawns released had their rostra amputated to allow for easier recognition on recapture. Two cruises by the RV *Lough Beltra* were made to search for prawns tagged and released in 1985. Using a 10 cm tube detector 200,000 prawns were screened in June and August. The numbers of tags recovered were very small but it remains to be seen whether this is a result of intensive fishing of the stocks or of greater dispersion than expected of the prawns.

In August and September a cruise was undertaken with two trawlers fishing in parallel, using trawls of 60mm and 70mm mesh. The catches landed using the 70mm trawl were 83% of those landed with the 60mm mesh.

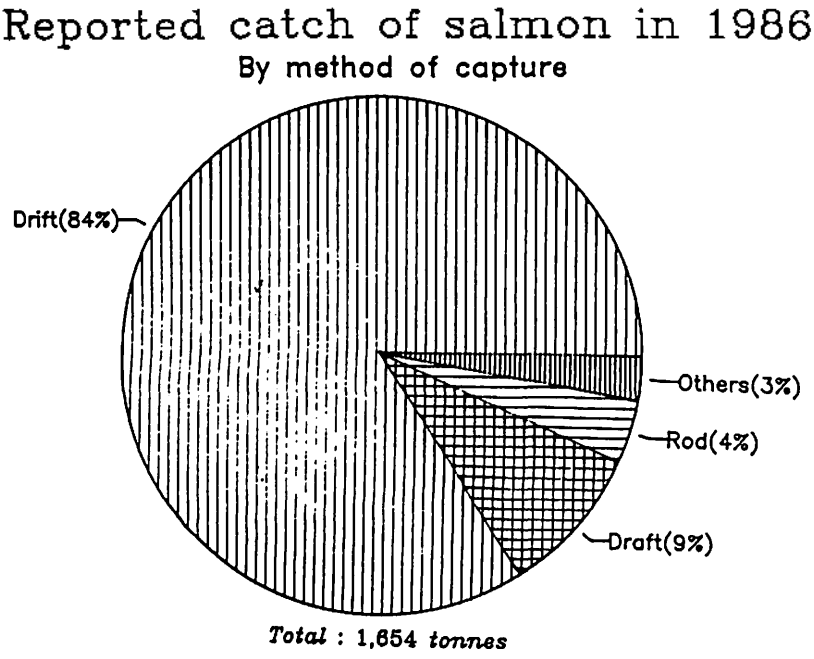
These findings were in strong contrast with the results from a similar exercise in 1985 when the catch landed with the 70mm trawl was 59% of that with the 60mm mesh. The results showed that the effects of using the larger mesh size were variable: in some cases they could be almost negligible, in others a significant reduction could occur. The use of the larger mesh size became mandatory under EEC Directive from 1st July. Its long term effect will probably be beneficial to the Nephrops fishermen by increasing the size of the prawns caught. The larger mesh also ensures that a much higher proportion of small whiting escape; small whiting in the catch are of no value to the prawn fishermen but can grow to become an important addition to the whiting catch if released from the prawn trawls.

3. SALMON AND INLAND FISHERIES

SALMON CATCH AND STOCK ABUNDANCE

Catch

In 1986, the catch of salmon and grilse showed a marked increase over the yields for the previous two years. The catch totalled 539,000 fish weighing 1,655 tonnes with a value of £5.25 million. Details of the catches are given in Appendices 9, 10 and 13. The distribution of the catch by weight is shown below and was similar to that of the past few years, with the great majority of fish going to the drift nets.



Weight (tonnes) of salmon caught by principal fishing methods.

Of the total of 1,655 tonnes caught, 136 tonnes were multi sea-winter salmon. There was also a very small proportion of previous spawners. The catch was the highest since 1976 and well above the average for the ten years, 1977-1986 (1,152 tonnes).

The substantial increase in the numbers of fish caught by rod and line reflects the overall increase in the numbers of salmon taken by all methods, rather than any change in the proportion of the total going to the rods. It suggests strongly that the stocks of salmon for 1986 were greater than for previous years.

The main grilse run took place between mid June and mid July. There was a difference in the pattern of arrival on the coast in 1986, with an earlier appearance of salmon along the southwest coast, particularly off Kerry. The proportion of fish taken along the southwest coast was higher early in the season, 60% being taken in June and 40% in July. In Donegal the arrival of the fish was later than usual but proportionately more fish were taken in June (55%) than in July (45%).

Instruments of capture

The total number of licences of all kinds issued for angling for salmon and sea trout was 20,079, compared with 16,062 in 1985. The numbers of draft net and drift net licences were slightly reduced.

Details of the numbers of licences issued and licence duties payable are given in Appendix 17.

Stock Abundance

The data available from salmon catch statistics are not suitable for calculating catch per unit effort (CPUE) as there is little uniformity in the type of gear used or the time spent fishing. Fixed engines are considered to be the best indicators, but their operation is influenced from year to year by weather conditions. The catch per licence issued is considered to give some indication of abundance from year to year. The table below gives the 5 year average from 1974 to 1979, from 1980 to 1984 and for 1985 and 1986. There was a substantial increase in the drift net catch in the present year but the catch by draft net and fixed engines continued to fall. Even allowing for the influence of weather on fixed engine catches, over the period 1974 to 1986 their catch per effort has steadily declined to little more than one third of the earlier average.

Numbers of salmon caught per licence

Year	Drift	Draft	Fixed Engines	Snap nets
1974-79	349	150	333	77
1980-84	278	76	276	21
1985	230	82	274	33
1986	525	77	134	42

In the North Atlantic as a whole, 1986 was considered a good year for salmon. The total catch recorded in the ICES Working Group Report on North Atlantic salmon was 7,066 tonnes, as against 5,996 tonnes in 1985. The increase in catch in 1986 was associated with a better than average survival of smolts in the sea.

Composition of catch

One sea-winter fish (small summer fish) were the dominant age group. The multi sea-winter fish were taken up to the end of April. Thereafter in May the proportion of multi sea-water and one sea-winter fish was approximately equal. From July onwards the majority of the fish were one sea-winter. An analysis of scales from the North Mayo and Donegal drift nets indicated that 98% of the catch taken in June and July were one sea-winter fish. In June, 96.4% of the fish were derived from 2-year-old smolts and in July 97.2%. The average weights of a random sample of fish taken in June and July were 3.3 kg and 3.4 kg, respectively. There was evidence from the Northern Region that fish taken in drift nets were larger than those taken in the draft nets (3.3 kg compared to 2.9 kg respectively).

In the country as a whole, the average weight of the rod-caught fish was 3.43 kg, from drift nets 3.00 kg and for draft nets 3.03 kg. The higher average weight of the rod catch is due to the fact that the greater part of the catch is taken in the early part of the year and again in September before and after the commercial season. Salmon are larger in the earlier part of the year as they are mostly two sea-winter fish (larger salmon) while in September the grilse which come into freshwater have had a longer growing season at sea and are therefore heavier.

Juvenile salmon surveys

The River Lennon in Donegal was electrofished in September 1986. The number of juveniles in the system was very low compared to similar river systems in the country. The highest recorded catch for a typical salmon nursery area was 14 per m for 1+ salmon. This is compared with a figure of 50 for 1+ salmon in the River Crana and 110 for 1+ salmon in the River Screebe in Connemara.

A preliminary survey of juvenile salmon was carried out on the Rivery Moy tributaries to locate the predominantly salmon waters in the system. There are proposals in hand to carry out a research programme on the River Moy similar to that undertaken in the Corrib system.

SALMON SURVIVAL AND MIGRATION

Escapement of salmon into freshwater

The stock of salmon in a river depends on catch and escapement. The majority of salmon are taken in coastal waters by drift nets which exploit the stocks of many rivers together. It is not possible to estimate stock abundance based on a river by river basis as it is not known what proportion from any river system can be attributed to the various drift net fisheries. We have therefore to rely on counts from rivers where the total escapement of salmon on their homeward migration is recorded. In the River Shannon there are counts available for the two arms of the river at Parteen and Ardnacrusha. The present count

of salmon in the Shannon is not comparable with the earlier counts at Thomond Weir as it excludes one very important salmon producing river, the Mulcaire. Its mouth is situated downstream of the Parteen counter but upstream of Thomond Weir.

The counter data from 1979-83 and for the years 1984, 1985 and 1986 are as follows:

Year	Ardnacrusha	Parteen	Byrrishoole	Erne	Clady
1979-83	1,880	1,390	628	553	222
1984	1,443	854	281	601	295
1985	2,303	793	529	701	278
1986	2,726	1,586	531	1,696	168

Only salmon derived from wild smolts are included in the Burrishoole count. In the Shannon and the Erne, fish derived from reared smolts are included and these make up the major portion of the stock in the River Shannon especially at Parteen.

From the data presented it can be seen that there was an increase in escapement on the Rivers Shannon and Erne. There was a decline in the escapement into the River Clady when compared to 1985 and it was below the 5-year average 1979-1983. The escapement into the Burrishoole River remained about the same as in the previous year.

The counter on the Boyne at Navan recorded 220 salmon in 1986. Incomplete counts from the Blackwater at Clondulane (12,091) and the Liffey at Islandbridge (2,374) provide data for the minimum escapement in the two rivers.

Survival in the sea

In the coded wire tagging programme, which has been in progress since 1979, a total of 148,866 tagged smolts were released in 1986. All were of hatchery origin. The first returns from this tagging programme are expected in 1987. There was an excellent return from smolts with coded wire tags in 1986. The best was obtained from the Salmon Research Trust rearing station on the Burrishoole System. The reared fish gave an overall return to the coast of 12.6% for the 2-year-old smolts and 17.7% for 1-year-old smolts before exploitation by nets. A return of 2.5% for 2+ smolts and 4.8% for 1+ smolts was obtained to the river of origin.

An analysis of tagging recovery data from the North Mayo drift net fishery in 1986 was published in Fishery Leaflet 138. Fish from all of the rearing stations were represented in the catch. The Salmon Research Trust hatchery in the Burrishoole River contributed by far the greatest number of fish to the Mayo drift nets. Just under 4% of all the fish released were recaptured in the area. Fish from the Erne station situated to the north and the River Lee which is situated on the south coast also contributed to the fishery.

In the River Shannon it was found that fish released in the estuary at Foynes gave a return rate of 2.75% to the coast compared to 2.32% from a release at Castleconnell. Data obtained from tagging in 1984 indicated that stocking carried out in the upper reaches of the Shannon on the River Brosna and Camcor river was not as productive, giving a return of 0.6% for the Brosna and 0.3% for the Camcor compared to 1.01% in the lower reaches of the Shannon at Castleconnell. Likewise from the Erne in 1986 a far better return was obtained from those released in the estuary than those released in the Termon river; 3.43% for the estuary compared with 0.74% in the Termon river.

Fish of Irish origin caught on the high seas

In 1986, 18 coded wire tags were returned from the Greenland High Seas Fisheries. This number does not reflect the composition of the catches in West Greenland but does indicate that the contribution of two sea-winter fish may be higher than previously thought considering the small size of the catch of two sea-winter fish in Irish waters.

There were 14 tags of Irish origin found in the Faroes Fishery in the 1985/86 season. From this it was calculated that a total of 121 tagged fish were caught. In previous years the greatest numbers of Irish tags were recovered from the discards i.e. fish under 60cm in length. In the 1985/86 season the catch of discards was reduced by new regulations imposed by the Faroes. In 1985/86 only 0.5 discards per 1,000 fish were caught compared to 1.23 per 1,000 in 1984/85. This reduction in the numbers of small salmon taken was helpful in reducing the numbers of salmon of Irish origin in the Faroes catch.

Fish of foreign origin in Irish waters

A number of fish tagged as smolts in England, Wales and Scotland were taken along the Irish coast. The majority of the smolts had been released at a sea ranching site in Argyll, Scotland. They were recaptured as far south as Dingle and as far north as the Fanad Peninsula. Likewise, some 22 grilse tagged as smolts in English and Welsh rivers were recaptured in Irish coastal waters. The majority of these originated from the River Tyne on the east coast of England. Recaptures were made as far south as Helvick Head and as far north as Lough Foyle. There were no recaptures along the east or southeast coast from the United Kingdom tagging programme.

Ulcerative Dermal Necrosis

There was no evidence of UDN in Southern, Western and Shannon Regions. During the period January-June there was some evidence of UDN in the Liffey and Slaney and also in the Ballina and Sligo districts. It was observed in the River Maine and the Upper Lake in Killarney in January and towards the end of the year in the River Lee.

Contribution of hatchery reared fish to the drift net catch

The adipose fin is removed from the majority of reared fish. At all of the major landing places for salmon the presence of fin clips in the catch is recorded. The data presented give an indication of the proportions of reared fish contributing to the catch.

Area	Number examined	Percentage with fin clips
Donegal	104,771	1.33
Mayo	29,535	3.81
Galway/Limerick	12,289	8.5
Kerry	46,977	3.6
West Cork	7,039	4.8
South Coast	19,646	3.6

In the Galway/Limerick area the highest proportion of reared fish was recorded. This is not surprising as the fishery is in the path of the reared salmon returning to the Shannon where there is a major rearing station. This drift net area also receives a contribution from Cong rearing station and from the Burrishoole.

Artificial propagation

The total production of ova was 3.2 million salmon and 2.8 million brown trout. Details of the output of the various hatcheries and particulars of restocking are given in Appendix 15. The top producers were Parteen Hatchery with 1 million salmon ova and Fanure Hatchery with 740 thousand brown trout.

SEA TROUT AND EELS

Sea trout

The sea trout fishery is predominantly a sport fishery although there was evidence of substantial catches of sea trout in the Dublin District both by drift and draft nets and this catch can be attributed to the bye law which permits small mesh nets in the District. The Connemara District had the highest yield of fish to the rod followed by the Bangor and Ballinakill Districts. Details of the catch are given in Appendices 11 and 12.

Twelve specimen sea trout were recorded. Lough Currane as usual had the highest yield accounting for eight of the specimens received. The largest sea trout, 4.6 kg (10.25 lb), was taken in Lough Fee, Connemara, by a visiting angler from the Netherlands.

The anglers' catch of sea trout in Lough Currane was sampled and as in previous years data on length, weight and sex were recorded. A total of 188 specimens were taken for age determination. The major portion of the sample migrated as 2-year-old smolts and had spent one year feeding in the sea before returning to freshwater. The next most important age group were finnock — trout that had spent only a few months feeding in the sea. Spawning marks were recorded in

17 of the 177 sets of scales collected and the majority of these had only one spawning mark on the scales. One fish was recorded with 5 and one with 6 spawning marks.

Eels

Eel catches (Appendix 14) were low in all the major fisheries in 1986. This is associated with persistently low temperatures through the spring and summer. Low temperatures could be expected to reduce the level of activity in the yellow eel population. This would be reflected in poor catches by the stationary gear in universal use.

Rainfall was high throughout the summer but low in early autumn so that there were no floods until late in October. The silver eel catch in the River Barrow was extremely small and poor catches were reported generally from the silver eel fisheries exploiting eels from lake systems. This may be explained by the lateness of the flooding. It also seems possible that the low temperatures of the summer resulted in smaller than usual numbers of eels maturing and migrating.

The number of elvers recorded at catching stations on the Rivers Erne and Shannon were low, but equal to or greater than catches in the previous three years. Elver catches elsewhere in north-western Europe have continued to be poor.

Further work in Lough Neagh together with a research cruise covering a number of lakes in the Shannon System took place. The results of the Shannon cruise were spectacular and included an overnight catch in Lough Ree of more than 400 eels in ten small fyke nets, the greatest ever recorded in an Irish lake in the course of experimental fishing. These results supported the conclusion drawn in 1985 that the stocking programme in the Shannon has been very successful and has led to a great increase in the eel stocks. The yield of eels in the catchment, however, remains low and it is now apparent that the fishing effort is inadequate. The current estimate is that the Shannon system could give a sustainable yield of 1,000 tonnes of eels per year.

Detailed survey drawings were prepared of the majority of eel trapping units in the Western Region to assist the Board in the supervision and monitoring of eel fishing activities.

During the year 42 eel fishing authorisations were issued bringing the number of valid authorisations to 65.

CONSERVATION AND MANAGEMENT

Conservation

The patrol work of the Regional Fisheries Boards was supplemented by the Department of Defence which provided four protection vessels

during the salmon fishing season to enforce the salmon fishery laws at sea. Aerial patrols were also provided.

A major innovation was the provision of a Bye-law limiting the catch of pike to three per day by any person and forbidding anyone to have more than ten dead pike in their possession. This is the first time that a limit has been placed on a "coarse" fish species.

A long-standing anomaly by which salmon nets with small mesh sizes was permitted in certain areas was removed. The minimum mesh size throughout the State is now 1.75 inches (44 mm).

Special regulations for 1986 included restriction of the open season for salmon netting in the Erne estuary from 11th June to 20th July and an extension of the open season for draft netting and fixed engines to 19th August in the Eastern Region, 7th August in the Southern and 31st July in the other Regions. The close season for trout in all the major lakes in the Shannon Region was extended to 13th October. A list of the Statutory Instruments is given in Appendix 18.

Employment in salmon and inland fisheries

Exclusive of persons employed on the marketing and transport of fish, a total of 5,813 found either wholetime or part-time employment in salmon and inland fisheries during the year. This figure includes 4,144 estimated as being engaged in netting for salmon, 220 engaged in eel fishing, 349 employed by the Central and Regional Fisheries Boards on protection and development of fisheries, 650 engaged in netting and protection work in the Foyle area, 450 in the provision of ancilliary services for inland fisheries and the remainder employed by proprietors of commercial and sport fisheries.

Leasing of State-owned fishing rights

In 1986, 133 State-owned fisheries — for the most part vested in the Land Commission — were leased by the Fisheries Division of the Department. Rents received during the year amounted to £9,615 compared with £9,953 in 1985. Thirty-nine fisheries which fell due for re-letting were advertised during the year.

Imports and exports of freshwater fish

The Department continued to issue import licences for live and dead freshwater fish in accordance with the Fisheries Acts. Stringent conditions are attached to each licence. Export licences for salmon and trout are also issued by this Department. All licensing requirements are designed to ensure the disease free status and quality of import and exports.

Licences were issued for the importation of about 599,000 goldfish for the pet trade and samples of these fish were screened for disease.

Salmon Review Group

A group of eight Members and three Observers, representing the Department and other Government bodies was set up in September, 1986 to review the entire salmon industry. The terms of reference were:

—to examine and review the measures applied for the protection and conservation of salmon stocks;

—to assess their effectiveness;

—to identify the constraints impeding their operation and

—to make recommendations on any changes considered necessary to improve the position.

4. AQUACULTURE

Designated areas

Advice and assistance from both the Department and BIM continued to be available throughout 1986 to various private operators of shellfish and salmonid rearing stations.

The implementation of section 54 of the Fisheries Act, 1980 continued and a total of 13 areas were proposed for designation during the year. A public inquiry was held in each case. This brought the total number of areas proposed for designation to 22.

The position regarding designation of each of the areas on 31st December, 1986 is shown in Appendix 21. A total of 11 areas were designated as areas within which it shall be lawful to engage in aquaculture in suitable blocks subject to licence. Applications for aquaculture licences in designated areas are currently being processed.

The designated areas include virtually all of the area suitable for fish farming stretching from Greatmans Bay in Galway to Broadhaven Bay in Mayo.

Salmonids

Production of salmon from sea cages has continued to increase at a spectacular rate. The value of farmed salmon in 1986 was £4.5 million, an increase of 44% over the 1985 figure.

Production of rainbow trout in freshwater in 1986 was approximately 460 tonnes compared with 530 tonnes in 1985. The reduction is due in part to the fact that a number of trout farms have diversified into salmon smolt production. In addition, the freshwater fisheries suffered considerable stock losses and structural damage during the 1986 storms. The losses and damage were so serious that the Department introduced a special aid scheme to assist those farmers in greatest need. Under the special aid package 50% grants were made available to help cover the actual cost of stock replacement and approved structural repairs.

The expansion of sea-farming of salmon created a substantial and urgent demand for smolts. There was a large demand for technical appraisal of sites proposed for the construction of smolt production units and the Department's Engineers provided the necessary service.

Technical advice was also given on the adaptation of a number of rainbow trout farms for smolt rearing. A number of enquiries were also processed for the establishment of new rainbow trout rearing units and a full technical service was provided. Encouragement was also given, where appropriate, to the provision of angling and other water-related leisure activities at rainbow trout farms to enhance their viability and generate public interest.

Due to the shortage in supply of salmon smolts 300,000 smolts were imported in 1986. Strict conditions are laid down for the import of salmon smolts because of the risk of disease. A number of hatcheries and freshwater smolt units were being constructed which, if they reach their projected smolt production levels, will be able to cater for the current shortfall in supply.

Substantial projects were under development in Counties Wicklow, Kerry, Leitrim and Donegal.

Mussels

The total production of mussels was over 10,000 tonnes, valued at almost £1.2 million. Of these, 1,400 tonnes were produced by rope culture, a spectacular increase compared with a production of 10 tonnes as recently as 1977. A substantial home market for mussels has developed, accounting for one quarter of the total production. Great Britain is the major importing country, followed by France.

Research in progress concentrates on determining the growth rate and meat yield of mussels collected as spat from various regions and grown in rope culture elsewhere. The aim is to locate the best areas for artificial culture. The preliminary results of a comparison between Bantry Bay, Clew Bay and Mulroy Bay indicated that the three were equally good for production purposes.

Escallops

Experiments in artificial spawning of escallops were begun in May and continued through June, using techniques established in the course of work at Lough Hyne. Eggs obtained in May failed to develop properly. Larvae were hatched successfully in June but survival was poor. The disappointing results can be explained by the cold weather which prevailed throughout the summer of 1986.

Rearing using artificially warmed water or in the open in a warm summer would clearly be feasible. However, the principal reason for embarking on this project was the failure of Mulroy Bay to yield surplus spat over a number of seasons. The problem in Mulroy Bay caused by pollution from TBT based paint, has been eliminated and in 1986 settlement was again satisfactory. This provides a much cheaper and more reliable source of spat than could be arranged by artificial spawning and the experimental work is being shelved.

A survey of the escallop population of Bantry Bay using spat collectors took place from May to August. The greatest abundance was recorded west of Whiddy Point, but numbers in general throughout the Bay were small and in many cases mussel spat proved much more abundant than escallop. It was concluded that Bantry Bay could not be considered a potential area for the collection of escallop spat for ongrowing elsewhere.

Oysters

In 1986 the native oyster harvest from the extensive fishery was 175 tonnes. In intensive culture native oysters yielded 100 tonnes and Pacific oyster 113 tonnes. The total value of the oyster industry was just under £1 million. The greater part of the catch was exported, Northern Ireland, followed by France being the chief markets.

The ascidian *Styela clava,* which has been introduced from abroad to Cork Harbour, is a potentially serious fouling organism in oyster culture. During May a survey of its distribution showed that *Styela* was not abundant, the main population being confined to Lough Mahon and the North Channel. Experiments showed that a brine dip of five minutes followed by exposure to the air for half an hour would kill the organism. It was suggested that oysters transferred from infected areas should be treated in this way to prevent it from spreading further.

5. ENVIRONMENT

WATER QUALITY

The Department continued to exercise an advisory role in regard to the issue by Local Authorities of licences under the Local Government (Water Pollution) Act, 1977. During the year 66 applications for licences were processed by the Department's Freshwater Licence Vetting Committee.

The Department continued to collaborate with the Regional Development Organisations and An Foras Forbartha in the preparation of draft Water Quality Management Plans.

Lough Sheelin

The Department continued its active involvement in the Lough Sheelin slurry pollution problem through the agency of the Lough Sheelin Management Committee. A further slight deterioration of the quality of the lake water was recorded in 1986 and is attributed to an increase in the amount of pig slurry being spread in the catchment. The Department continues to view the situation with concern and is determined to ensure that all possible measures are taken to reverse the present trends.

Chemical monitoring

A spillage of PCBs (polychlorinated biphenyls) took place in 1980 in the River Breagagh and traces have persisted ever since. Sediments and fish from the Breaghagh and from the River Nore, upsteam and downstream of its confluence, were collected together with control samples from the Rivers Dinin and Barrow. Muscle, liver and ova were taken from trout at each of the sampling stations. PCBs were still present in the Breaghagh and in the Nore downstream of the confluence.

Fish kills

Reports of fish kills by the Water Pollution Officers attached to the Regional Fisheries Boards were received on a regular basis and were evaluated. The worst affected river in the country was the River Feale on which 17 fish kills were reported during 1986. All of these were attributable to effluents being discharged from a milk processing plant. There were 6 fish kills reported from the River Deel, all associated with farm effluent. In the upper Erne catchment 12 fish kills were recorded. The high rainfall during 1986 increased the

effluent from silage. Most of the fish kills were associated with agricultural sources.

The Department notes with concern the recurring pattern of summer fish kills attributable mainly to agricultural sources and the increase in the extent of what is called "moderate pollution" of our freshwater. While moderate pollution in itself does not cause mortality it can damage our fish stocks by affecting the food chain and the general balance of the aquatic ecosystem. More immediately, by reducing the assimilative capacity of the waters, it increases the likelihood of a fish kill resulting from a relatively minor discharge of polluting matter. For these reasons it is vital for the future welfare of our freshwater fisheries that all necessary measures are taken to minimise the run-off of all polluting matter from agricultural activities throughout the land.

Organotin

The widespread use of anti-fouling compounds containing tributyltin (TBT) has been implicated in the mortality of molluscs, perhaps the most serious instance being the collapse of the escallop spat settlement in Mulroy Bay. By the end of 1986 the use of these anti-foulants had virtually ceased, but traces of TBT were still present in many areas.

The symptoms of TBT contamination in oysters include thickening of the shell, the presence of jelly between the laminae of the shell and the development of a pit around the adductor muscle attachment. Small oyster spat held in lantern nets were deployed around the coast from April to October to monitor the presence of the contaminant. Positive reactions were found in many areas, including Mulroy Bay, in spite of the fact that the TBT net dips had not been used there for more than a year. Ballinakill Bay was found to be the most seriously affected area.

DRAINAGE AND WATER ABSTRACTION

Post-drainage Rehabilitation

Drainage schemes were in progress in the catchments of the Maigue, Corrib/Mask, Bonet, Boyle/Lung and Monaghan/Blackwater during 1986. The Boyne Drainage Scheme was completed in 1985.

In accordance with the Arterial Drainage Act, 1945 close liaison was maintained between the Department and the Office of Public Works in relation to fisheries rehabilitation works so that the adverse effects of drainage on fisheries would be minimised and to ensure that the drainage works are carried out in such a way as to cause the least possible damage to fish life.

Rehabilitation works were carried out by the Central and Regional Fisheries Boards and financed by the Office of Public Works. The

Fisheries Boards work closely with the Department in the drawing up and implementation of post drainage rehabilitation works on all rivers. The Boards also maintain close contact at local level with Office of Public Works officials on the timing and extent of post drainage maintenance works.

Two experimental weirs and an experimental spawning bed of specially graded gravels were constructed on the Belhavel River (a tributary of the Bonet) with the assistance of officers of the North Western Regional Fisheries Board. The performance of these structures will be monitored in the coming years.

Plans for the rehabilitation of the River Maigue (upper) and Morningstar (lower) were drawn up. These plans will be implemented by officers of the Shannon Regional Fisheries Board with funding by the Office of Public Works and under the supervision of an officer of the Department.

A plan was drawn up for the rehabilitation of the Trimblestown River and all of the structures specified were installed by Office of Public Works staff. These included eleven spawning beds of which ten were later found to have been used by spawning salmon — each bed containing between one and three redds. The spawning beds were constructed in accordance with the mixture of gravels identified in spawning fords in rivers not subjected to changes in the composition of gravel in use.

A pilot scheme for the rehabilitation of part of the Kells Blackwater involving boulder and weir implacement and the provision of a walkway for anglers was implemented to improve an angling stretch.

Biological monitoring

Biological monitoring through drainage works continued on the River Bonet, Co. Leitrim and downstream of Lough Gill in 1986. Sampling of invertebrates on the main channel upstream and downstream of dredging, over a distance of 15 km, were evaluated.

Suspended solids during dredging ranged from 50 to 287 ppm. Sediment cores were taken in Lough Gill downstream of the dredgers to determine sediment deposition arising from drainage. The results will be available in 1987.

Dunkellin/Kilcolgan drainage

A report commissioned by Office of Public Works at the behest of the Department on the impact which the Dunkellin/Kilcolgan Scheme might have on the Clarinbridge oyster fishery was completed by the Departments of Oceanography and Zoology of UCG and accepted by this Department. Conditional approval in principle to the execution of this Scheme was given by the Department.

River improvement works

A full service was given to the Regional Fisheries Boards on river improvement and development works proposed by them. Designs were prepared for the easement of obstructions to fish movement and surveys were carried out in conjunction with Biologists of the Central Fisheries Board of systems where comprehensive development works are envisaged, namely on the Inny and Comeragh systems and the Bantry Bay Rivers. A programme of such works was completed on the Comeragh System.

Water abstraction schemes

Water abstraction schemes especially those for public water supply purposes are kept under careful scrutiny by the Department. The impact of such schemes on lake levels, river flows, fish migration, stock levels and angling conditions is assessed, and measures to mitigate adverse effects are devised and recommended to the relevant Local Authority.

Gas pipe lines

The pipeline laid by an Bord Gais Éireann in 1986 to Waterford and Limerick involved ten major river crossings of which five were monitored during excavation, pipe laying and bed and bank reinstatement. The crossings of the Rivers Anner, Suir, Clodiagh and two crossings of the Morningstar were investigated. Turbidity, the concentrations of suspended solids and the amount of silt deposition were examined in all cases.

It was found that the greatest impact on the watercourses occurred during back filling of the trench, corroborating a finding made during the laying of Phase 1 of the North Eastern Pipeline in 1984. A major factor influencing the impact was found to be the structure on which the machines travelled and a list of these structures in preferential order was incorporated in a report which was submitted to An Bord Gais Éireann.

In 1986 the Department was consulted about water abstraction schemes on the Rivers Linguan, Smearlagh, Feale, Liffey, Eske, Gweedore and Slaney and Lough Muckno, Doolough and Sillogue Well.

The technical staff of the Department carried out investigations of the impact of these schemes on the fisheries of the rivers in question and advised on measures to be taken and works to be carried out to minimise and offset damage to fishery interests. A high degree of co-operation was afforded by the local authorities concerned in all cases.

Small Hydro-Electric Schemes

There is still a considerable level of interest in the development of small hydro-electric schemes and some 15 proposals were examined during the year in the light of protection of the fishery interest.

Problems are continuing to arise in relation to the development of old mill sites for the generation of electricity. A full advisory service is provided by the Department's Engineers and every effort has been made to ensure early consultation. In spite of this, difficulties are still being experienced in ensuring that the Fisheries Acts are complied with. Particular problems include the provision of suitable screens to prevent the entry of fish into race-ways and turbines, and the taking of adequate measures for the safe passage of migratory fish through river channels deprived of the full natural flow of water and over mill dams.

In an effort to ease some of the difficulties arising, research and development projects were initiated at sites on the Suir at Holy Cross and the Linguan near Carrick-on-Suir on the development of electric fish-screening facilities for power projects and investigation of the safety of allowing salmon smolts to pass through low head water turbines as used in these small hydro-electric plants.

MARINE ALGAL BLOOMS

As in 1985, the incidence of algal blooms was relatively low. This may be associated with the prevailing poor weather throughout the summer. Bioassays for Paralytic Shellfish Poisoning (PSP) were carried out on five occasions, with negative results in all. No closure of mussel or oyster beds was therefore necessary.

High numbers of *Gonyaulax tamarensis* and *G. spinifera* were reported from Cork Harbour in early July. A bloom of *Rhizosolenia deliculata* caused discolouration of water in Dundalk Bay in late June, and some dead fish were reported from Clogherhead. The bloom persisted for only a few days and was broken up by strong winds.

At sites associated with Flagellate X, one of the most significant trends was the increasing dominance of the phytoplankton by micro-flagellates in the North Water of Mulroy Bay, and the very low incidence of dinoflagellates. This site is now used primarily as a brood stock unit, main production having been relocated to the Broadwater site where water circulation is much greater. At Ardbear and in the Killary it was possible to issue warnings of impending flagellate blooms in time for the sea cages to be moved to safety so that no fish kills occurred in a potentially hazardous situation.

Sampling on the southwest coast revealed periodical high counts of *Dinophysis* species and *Prorocentrum minimum* in the vicinity of mussel farms. Bioassays for Diarrhetic Shellfish Poisoning (DSP) confirmed that no contamination had taken place.

6. EUROPEAN ECONOMIC COMMUNITY

Common Fisheries Policy

Regulations adopted during Councils of Fisheries Ministers in 1986 included those of 25 June, 22 September, 5 November, 3 and 17/18 December were as follows:

(1) the laying down of technical measures for the conservation of fishery resources and setting out characteristics of fishing vessels

(2) control measures (including provisions concerning monitoring of catches)

(3) new structures policy. The package of structural measures will run for a period of ten years and an allocation of 800m ECUs has been made for the first five years (1987-1991)

(4) the fixing of TAC's and quotas for 1987 (see Appendix 21)

(5) fishery agreements with Norway, Sweden, Faroe Islands, Canada, Greenland and French Guyana

(6) guide prices for 1987

(7) measures applicable to vessels of the ten Member States in the waters of Spain and Portugal, and to the vessels of Spain and Portugal in the waters of the other ten Member States.

(8) amendments to the regulation on technical conservation measures. In Ireland's case, this resulted in a shift northwards of the dividing line between the areas in which 80mm and 90mm nets could be used.

EUROPEAN AGRICULTURAL GUIDANCE AND GUARANTEE FUND (FEOGA)

Guarantee Section

The prices for the 1986 marketing year came into effect on 1 January 1986. The following table shows approximate price changes for the quality grades of most interest to Irish fishermen:

Species covered by Community price support arrangements	Price change (%)
Spur dogfish	+ 2
Spotted dogfish	0
Cod	+ 6
Saithe	+ 3
Haddock	+ 5
Whiting	+ 4
Ling	+ 3
Herring	− 3
Mackerel	+ 1
Hake	+ 6
Plaice 1 January to 30 April	+ 3
Plaice 1 May to 31 December	+ 5

In addition, two new species, megrim and monkfish, were added to this list from 1 March 1986, with EEC prices being set for nephrops and edible crab.

EEC subvention for withdrawals in 1986 amounted to IR£1.020m in respect of fish which failed to meet the minimum intervention price.

Guidance section

In 1986 the EEC Commission decided to grant-aid projects involving the construction and modernisation of inshore fishing vessels and the construction of aquaculture establishments as part of the common measure for restructuring the Community's inshore fishing industry. The grants awarded to Ireland amounted to £6.547m in relation to the construction of 14 new fishing vessels, modernisation of 63 existing vessels, establishment of 12 aquaculture projects and fish processing projects.

7. AFFILIATED ORGANISATIONS

An Bord Iascaigh Mhara

The Board, in co-operation with the industry, intensified its promotional efforts on export markets. In addition to participation at the major international food fairs, over forty fish exporters were assisted under the Board's Market Incentive Scheme for participation in overseas promotions and other marketing activities. Activities at the Board's Paris Office expanded with increased emphasis on market research, added value products and marketing services to the fish farming sector.

Twelve market research projects were undertaken during the year, including a major investigation of the international production and market situation of farmed salmon in the ten main supplying and consuming countries. Promotional activities carried out on the Home Market included radio advertising and a poster campaign emphasising the role of fish in a healthy diet.

The programme of exploratory fishing and gear technology was mainly geared to more of the medium sized fleet (24m to 27m vessels) to exploit offshore waters for high value fish such as hake, monk, megrims, prawn and squid. Longlining for hake was expanded to include five boats, working grounds from the South-West of Ireland to North-West of Scotland. The shellfish programme was directed at developing the non-traditional species, mainly spider crab, whelks, shrimps, scallops and clams.

The attainment of a high degree of crew skill and vessel working efficiency, to match the performance of competing fleets, are central to the Board's Education and Training Programme. A wide range of courses were provided. These included in-service courses at ports, special courses abroad, fish farming and career guidance. The course programmes amounted to 1,267 in-centre trainee weeks for 187 fishermen and fish farmers together with 599 in-service trainee weeks for 144 fishermen at the fishing ports.

Central and Regional Fisheries Boards

The Central Fisheries Board and the seven Regional Fisheries Boards which were established in 1980 are responsible for the protection and development of inland fisheries and for the development of angling.

The Annual Report of the Central Board gives details of the activities of the Central and Regional Fisheries Boards during the year.

The negotiation of a Staff Scheme for Clerical and Administrative Grades in the Central and Regional Fisheries Boards was at an advanced stage in 1986.

The Central Fisheries Board is preparing a fisheries development plan in respect of the seven fisheries regions.

During 1986 the Department arranged for discussion to be initiated between both the Central Fisheries Board and Bord Fáilte with a view to striking a co-ordinated and integrated approach to development, promotion and marketing of angling tourism. Discussions had reached an advanced stage at the end of the year.

Foyle Fisheries Commission

The Foyle fisheries commission is a statutory North-South body established to conserve, protect and improve the fisheries of the Foyle area. Its main activities are:—

—implementing its own Regulations, e.g. on fishing engines, licences, net sizes, close seasons, etc. (particulars of Regulations made in 1986 are given in Appendix No. 19)

—operating the Commission's commercial fishery

—monitoring water quality and pollution.

The Commission is made up of four Commissioners, two (one senior and one junior) appointed by the Minister for Tourism, Fisheries and Forestry and two (one senior and one junior) appointed by the Department of Agriculture for Northern Ireland. The post of Chairman alternates between the two senior Commissioners. The Commission's office is in Derry, it also has an office in Ballybofey.

The following are details of redd counts and catches of salmon and sea trout in the Foyle area in 1985 and 1986:—

	1986	1985
Spawning counts of redds	2,975	4,717
Catch of salmon and grilse by commercial engines		
Number of fish	46,354	40,521
Weight (kg)	153,174	135,889
Number of salmon and grilse caught by rod	1,172	1,814
Number of sea trout caught by rod	2,929	4,838

The Salmon Research Trust of Ireland Incorporated

The annual report on the Trust for 1986 gives a detailed account of its work during the year. The work of the Trust is directed by a Committee of Management consisting of seven members — two

nominated by the Minister for this Department, three by Arthur Guinness & Son plc and two elected members.

The census work in 1986 showed an improved run of two sea-winter fish when compared with 1985 (42, compared with 25 in 1985). The wild grilse run was 469 fish compared with 504 in 1985. The survival from smolt to grilse to freshwater improved to 7.9% this being the highest value since 1980 (8.6%). The very low count of grilse was due to the small smolt run in 1984 produced from a relatively small spawning escapement of wild fish. The survival to grilse per grilse female exceeded the theoretical required value of 2 for a self sustaining population. The smolt run in 1986 at 5,099 was the lowest level of smolt production since records began in 1970.

It represented only 0.45% survival from egg to smolt compared with normal values of 0.65%. The most probable cause of this decline was the prolonged cold weather of winter and spring 1986.

The spawning stock in 1986 was 591 fish which was better than the average for 1980-84 but this was due to 30% of the spawning stock being composed of reared fish.

The overall total of reared fish in 1986 was 1,080 an increase of 98 over the previous recorded catch of 1985. The S1 smolts performed better than the S2 smolts giving a survival rate of 4.4% to the river compared to 2.4% for S2 smolts. The return to the coastal fisheries for reared smolts was 32.7% for S1 smolts and 24.8% for S2 smolts. Exploitation by coastal nets of Burrishoole stock was 85% and 89% for 1-year-old and 2-year-old smolts respectively.

The reared grilse in 1986 was slightly smaller (2.42 kg in 1986 of 2.87 kg in 1985) and in worse condition than in 1985. The largest grilse was 78 cm in length and weighed 4.56 kg. The salmon rod catch was the third highest on record and it was the first year in which the catch of reared salmon exceeded that of wild fish, being 72.5% of the total caught.

There was a decrease in the number of wild sea trout counted through the trap when compared with 1985. The percentage of finnock was estimated at 58.7%. The annual spawning escapement, 1,244, of sea trout was marginally less than 1985 (1,308). The total of 3,454 sea trout smolts which migrated downstream was 18.5% lower than the total recorded in 1985 and below the average record over the last 16 years. The catch of 614 sea trout was an improvement of the 1985 catch of 497 fish. The increase was mainly due to an increased catch of reared sea trout (87 fish in 1986 compared with 16 in 1985).

A total of 187,480 1-year-old smolts and 34,495 2-year-old smolts were sold to fish farmers for cage culture in the spring of 1986. All smolts were given a ten day course of oxolinic acid added to the food

immediately prior to transfer to sea cages and treatment was continued following transfer for a mininum period of seven days. Post transfer losses after one month amounted to 2% for 1-year-olds and 5.4% for 2-year-olds. At the end of 1986 an estimated total of 246,000 Fanad Molvi and 25,500 Burrishoole fish were in stock. These will be sold for cage rearing in the spring of 1987.

Research assistance

Studentships carrying a stipend of £900 a year are awarded to holders of first class degrees for research in all sectors of aquatic biology. The research is supervised by a University lecturer and normally leads to the award of a PhD degree. Research topics are proposed both by scientists at the Fisheries Research Centre and by University staff. A joint committee representing the Department and the Universities agrees on the topics and assesses candidates for the Studentships. Up to six Studentships may be funded during the year.

In the summer vacation 30 Bursaries are awarded to undergraduates to assist Departmental scientists in their work. The Bursaries are held for a period of eight weeks for which the students are paid £480.

Studentships

Six post-graduate studies were in progress under the Department's Studentship Scheme:

1. The ecology and activity pattern of roach in the Corrib catchment (University College, Galway).
2. The use of mitochondrial DNA as a marker for fish species (University College, Galway).
3. A study of the chemistry of sediments and associated biota in selected areas of inshore coastal water (Trinity College, Dublin).
4. Studies of roach population of Lough Neagh. (University of Ulster).
5. Predation and invertebrate community structure in running water (University College, Cork).
6. An extensive electrophoretic investigation of Atlantic salmon (University College, Cork).

One further project was awareded in 1986:

A population study of the eel in the Burrishoole catchment (Trinity College, Dublin).

Bursaries

Thirty undergraduate students were recruited for eight-week periods during the summer vacation to assist the technical officers in the collection and processing of material. They were employed in 14 project areas:

Monitoring landings of salmon and demersal fish
Population dynamics of herring
Population and growth studies of nephrops
Mussel research
Escallop research
Demersal fish research
Sea trout census at Waterville, Co. Kerry
Cyprinid census in Leixlip Reservoir
Juvenile salmon studies on various rivers
Eel biology
Fish pathology
Chemistry in the aquatic environment
Marine algal blooms.

8. CONFERENCES AND COMMITTEES

International and National conferences and committees

Abroad

European Economic Community
- Commission and Council meetings, Brussels and Luxembourg.
- Scientific and Technical Committee for Fisheries, Brussels.

International Council for the Exploration of the Sea.
- Meetings in Copenhagen
  - Statutory Meeting.
  - Avisory Committee on Fisheries Management.
  - Bureau.
- Working Groups in Copenhagen
  - North Atlantic Salmon.
  - Norweigan Sea/Faroes Salmon Fishery.
  - North Sea Roundfish.
  - Irish Sea and Bristol Channel.
  - Mackerel Stock Assessment.
  - Herring Stock Assessment.
- Working Groups elsewhere.
  - Larval surveys south of 62°N, Hirtshals, Denmark.
  - Exceptional algal blooms, Hirtshals.
  - Diseases and pathology of marine organisms, Hirtshals.
  - Fishing technology and fish behaviour, Hull, England.
  - Magnetic tag-scanning methods, Aberdeen, Scotland.
  - Introductions and transfers of marine organisms, Gdynia, Poland.
  - Fisheries units in ICES Areas VII-VIII, Nantes, France.
  - Workshop on mackerel egg production, Lowestoft, England.
  - Marine chemistry, Helsinki.

American Fisheries Society Symposium on Anadromous and Catadromous Fish, Boston.

Atlantic Salmon Trust.
- Honorary Scientific Committee, London.
- International Atlantic Salmon Symposium, Biarritz.

FAO/WHO Codex Alimentarius meeting, Oslo.

National Research Council Canada Symposium on Mussel Culture, Prince Edward Island.

North Atlantic Salmon Conservation Organisation, Edinburgh.

Oslo and Paris Commissions Joint Monitoring Group, Copenhagen.

West European Fish Technologists Association, Helsinki.

Home

Foyle Fisheries Commission.

Freshwater Research Group.

Irish Aquaculture Association, Disease Diagnostic Board.

Irish Marine Sciences Association.

Irish Specimen Fish Committee.

National Board for Science and Technology, Salmon Advisory Committee.

National Committee for Biology.

River Erne Joint Protection Committee.

Water Pollution Advisory Council.

Water Resources Advisory Committee of An Foras Forbartha.

APPENDICES

APPENDIX 1

Quantity and Value of Sea Fish (excluding Salmon) returned as landed by Irish Registered Vessels in Irish and Foreign Ports during 1985 and 1986.

Species	Quantity (tonnes)		Value (IR£'000)	
	1986	1985	1986	1985
DEMERSAL				
Flat Fish				
Brill	105	128	265	262
Dabs	462	486	142	125
Lemon Sole	265	330	274	292
Megrims	2,003	1,702	2,133	2,682
Plaice	2,550	3,089	2,096	2,228
Sole	462	442	2,003	1,525
Turbot	192	189	779	674
Other Flat Fish	275	320	237	290
Round Fish				
Cod	6,105	6,830	5,279	5,451
Haddock	2,267	3,938	1,649	2,583
Hake	1,879	1,159	3,622	1,584
Ling	824	968	437	499
Saithe	2,033	2,413	828	1,164
*White Pollack	1,320	—	894	—
Whiting	7,018	9,193	2,669	2,587
Other Demersal				
Dogfish	4,556	7,992	1,589	2,092
Monkfish	1,949	1,962	2,927	2,415
Ray/Skate	2,029	2,630	1,273	1,497
Other Demersal	157	315	168	330
TOTAL DEMERSAL	36,451	44,086	29,264	28,280
PELAGIC				
Herring	38,020	31,978	5,872	4,347
Mackerel	58,000	65,633	6,778	8,356
Horse Mackerel	28,828	27,201	2,333	1,283
Blue Whiting	16,440	668	573	21
Sprats	4,184	3,964	410	374
Other Pelagic	348	—	12	—
TOTAL PELAGIC	145,820	129,444	15,978	14,381
TOTAL WETFISH	182,271	173,530	45,242	42,661
CRUSTACEANS				
Crabs	3,670	4,108	1,311	1,376
Crawfish	66	73	703	796
Dublin Bay Prawns	6,151	4,737	7,361	5,043
Lobsters	292	305	2,513	2,817
Palaemonid Shrimps	93	104	439	438
TOTAL CRUSTACEANS	10,272	9,327	12,327	10,470

Species	Quantity (tonnes)		Value (IR£'000)	
	1986	1985	1986	1985
MOLLUSCS				
Escallops	533	388	626	451
Queen Escallops	61	73	59	29
Mussels	10,615	10,358	1,191	1,240
Oysters	388	317	937	615
Periwinkles	1,810	2,150	761	903
Palourdes	13	15	52	58
Squid	730	275	1,299	516
Other Molluscs	238	90	56	24
TOTAL MOLLUSCS	14,388	13,666	4,981	3,836
Sea Urchins	49	77	73	99
TOTAL ALL FISH	206,980	196,600	62,623	57,066

In addition to the above landings 16,512 tonnes of Mackerel valued at IR£1,816,320 were transhipped at sea for export by Irish registered vessels during 1986.

*Prior to 1986 White Pollack was included with Saithe.

APPENDIX 2

Comparison of the Average Price per tonne of various kinds of Sea Fish, 1978-1986

SPECIES	1978	1979	1980	1981	1982	1983	1984	1985	1986
	IR£	IR£	IR£	IR£	IR£	IR£	IR£	IR£	IR£
Sole	2,093	2,184	2,192	2,565	2,759	2,932	3,304	3,437	3,992
Brill	740	826	866	1,145	1,423	1,661	1,790	2,054	2,511
Turbot	1,231	1,444	1,389	1,781	2,314	2,643	2,929	3,362	4,050
Plaice	519	557	514	575	690	740	726	720	823
Dabs	195	215	193	166	173	221	230	253	308
Megrims	206	260	229	322	269	390	494	637	798
Ray/Skate	306	375	372	428	466	504	489	565	619
Cod	406	448	375	411	482	578	656	791	855
Haddock	365	373	291	258	296	383	480	656	727
Hake	428	571	499	674	764	936	947	1,223	1,449
Whiting	217	228	167	177	182	251	284	279	380
Saithe	301	312	297	293	335	347	427	456	405
White Pollack									669
Horse Mackerel						124	99	47	81
Herring	295	287	255	170	176	163	142	136	154
Mackerel	63	74	83	105	113	130	115	129	119
Sprats	38	67	75	63	74	89	94	94	98

N.B.—"Average price" as shown in this table represents total value divided by total weight for each kind of fish, year by year. It does not purport to take direct cognizance of any abnormal rise or fall in price attributable to a seasonal glut or shortage of a particular kind of fish.

APPENDIX 3

TOP PORTS 1986

Value and Quantity of Landings of Sea Fish (excluding Salmon) at ports at which the value of such Landings exceeded IR£200,000 in 1986.

The values shown are in IR£'000 and the quantities in Tonnes.

Port	Total		DEMERSAL		PELAGIC		SHELLFISH	
	Val.	Qty.	Val.	Qty.	Val.	Qty.	Val.	Qty.
1. Killybegs	12,578	99,715	2,270	3,154	9,543	96,129	766	431
2. Howth	6,697	9,669	4,322	6,238	246	1,650	2,129	1,782
3. Castletownbere	4,113	6,246	3,187	3,191	418	2,726	508	330
4. Dunmore East	3,229	8,862	1,809	2,327	919	6,096	500	439
5. Rossaveal	2,875	5,759	1,199	1,940	429	2,837	1,246	982
6. Clogherhead	1,823	2,042	387	582	2	14	1,434	1,445
7. Burtonport	1,741	3,708	1,387	2,171	188	1,260	166	276
8. Greencastle	1,597	2,583	1,419	2,408	*	2	178	173
9. Cobh	1,418	6,959	85	136	1,320	6,819	13	3
10. Skerries	1,392	1,553	313	540	1	4	1,079	1,009
11. Rathmullen	1,229	9,403	6	18	1,200	9,246	23	138
12. Dingle	1,157	1,956	604	1,209	80	457	473	290
13. Valentia	1,155	1,098	764	774	23	137	368	187
14. Kilmore Quay	1,150	1,302	838	984	4	32	307	287
15. Helvick	592	993	481	749	28	167	83	78
16. Kinsale	560	3,416	196	276	323	3,092	42	48
17. Downings	525	898	410	615	0	0	115	283
18. Moville	523	1,535	421	661	*	1	102	873
19. Galway	516	2,637	173	248	262	2,372	81	16
20. Bantry	458	829	2	8	*	+	456	821
21. Cromane	451	5,307	8	12	0	0	443	5,296
22. Carna/ Cill Chiaráin	369	204	34	54	0	0	335	150
23. Belmullet/ Blacksod	338	232	0	0	0	0	338	232
24. Balbriggan	321	398	91	168	*	*	230	229
25. Castlegregory	320	348	19	54	*	*	301	294
26. Clifden/Cleggan	320	249	148	210	*	*	172	39
27. Union Hall	301	535	189	263	39	222	73	50
28. Malin Head	284	591	0	0	0	0	284	591
29. Baltimore	278	910	106	132	118	753	55	25
30. Duncannon	265	563	193	207	1	5	72	351
31. Kincasslagh	265	1,246	9	12	166	1,190	90	45
32. Rosslare	265	380	248	357	1	11	15	12
33. Killala/Kilcummin	263	369	244	352	0	0	19	17
34. Fenit	262	269	84	191	*	*	178	78
35. Arklow	248	344	163	255	2	15	83	74

Port	Total		DEMERSAL		PELAGIC		SHELLFISH	
	Val.	Qty.	Val.	Qty.	Val.	Qty.	Val.	Qty.
36. Roundstone/ Ballyconneely	248	183	75	147	0	0	173	36
37. Bunbeg	241	395	223	371	0	0	18	24
38. Ballyglass	230	423	95	148	0	0	135	274
39. Ballycotton	222	424	153	203	27	181	42	40
40. Porturlin/ Portacloy	222	293	124	161	0	0	98	132
41. Garnish/ Travara	281	174	2	7	3	21	213	146
42. Carlingford/ Greenore	211	178	0	0	0	0	211	178
43. Wexford	207	2,672	5	5	0	0	202	2,667

*Indicates a value of less than IR£500.

+Indicates landing less than 500 Kg.

APPENDIX 4

Imports and Exports of Fish and Fishery Products in 1986 and 1985

	Quantity		Value	
	1986	1985	1986	1985
	Tonnes	Tonnes	IR£'000	IR£'000
I.—IMPORTS:				
Fish: Fresh, chilled	12,045	12,336	3,849	3,608
Fish: Frozen	1,677	1,887	3,034	3,153
Fish: Salted, Dried or Smoked	1,238	1,261	2,097	1,958
Shellfish: Fresh, Salted or Dried	1,188	902	5,374	3,287
Prepared or preserved fish	7,359	7,294	17,628	18,972
Prepared or preserved shellfish	121	232	464	644
Canned fish	391	525	661	883
Fishmeal and fish oils	11,883	13,182	4,593	4,993
TOTALS	35,902	37,619	37,700	37,498
II.—EXPORTS:				
Fish: Fresh, chilled	33,794	36,852	24,546	22,039
Fish: Frozen	79,116	85,945	30,944	38,886
Fish: Salted, Dried or Smoked	10,796	12,309	10,257	8,932
Shellfish: Fresh, Salted or Dried	16,328	14,413	26,571	21,134
Prepared or preserved fish	1,107	1,271	1,550	1,813
Prepared or preserved shellfish	387	616	574	1,016
Fishmeal and fish oils etc.	6,022	3,386	1,120	927
Landed directly by Irish registered vessels into foreign ports				
Fish	13,047	8,780	6,465	5,190
Shellfish	260	71	416	111
TOTALS	160,857	163,643	102,443	100,048

In addition to direct landings into foreign ports 16,512 tonnes of mackerel valued at £1,816,320 were transhipped at sea by Irish registered vessels giving a final total for exports of £104m.

APPENDIX 5

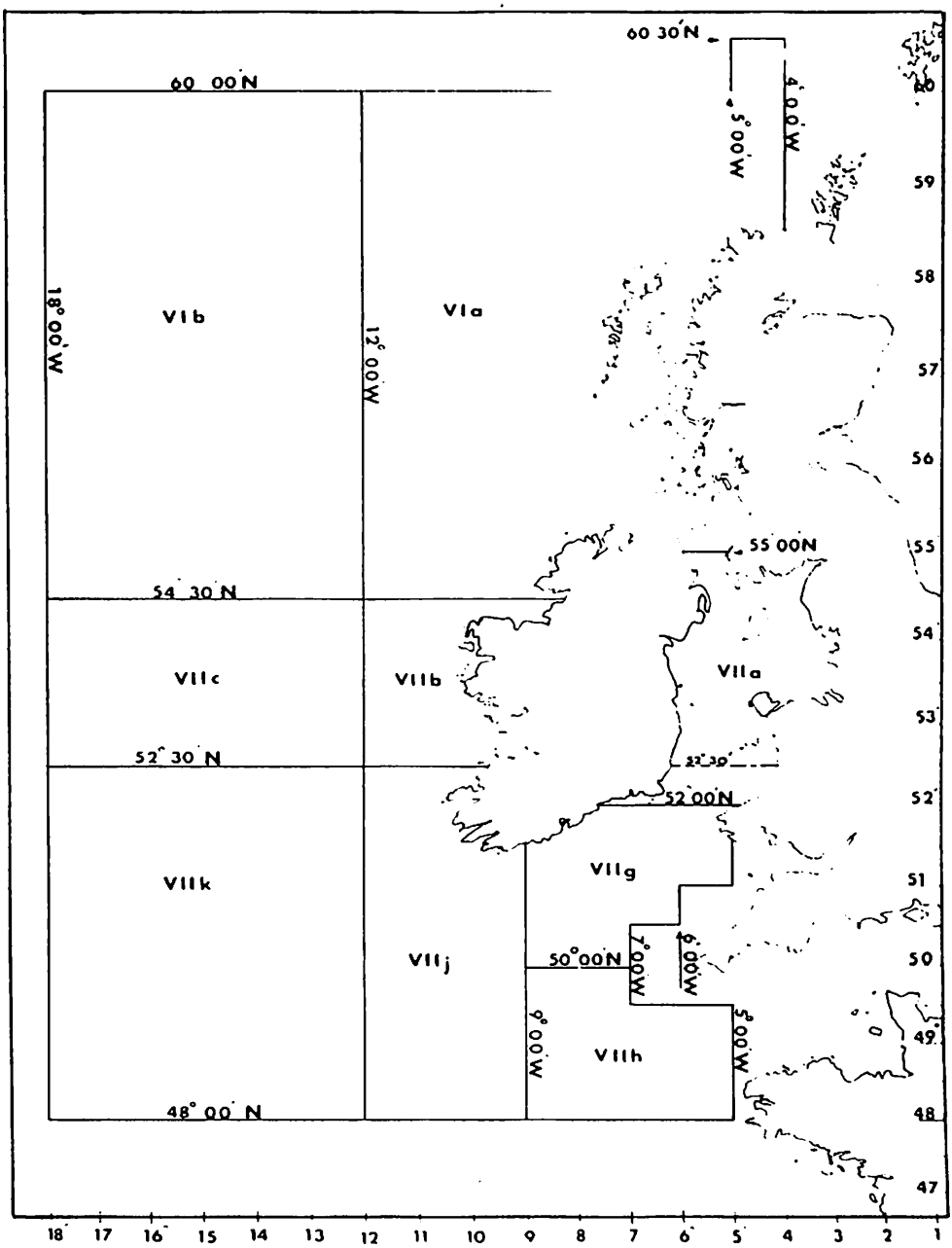
Mackerel and herring landings at ports where either species exceeded 1,000 tonnes

Ports	Herring		Mackerel	
	Quantity Tonnes	Value £'000	Quantity Tonnes	Value £'000
Castletownbere	743	168	1,801	229
Cobh	6,739	1,311	80	9
Dunmore East	4,962	793	99	31
Galway	*		1,671	234
Howth	1,605	239	45	7
Killybegs	14,010	1,868	43,768	5,063
Rathmullen	3,549	536	5,697	664
Rossaveal	2,384	334	453	95

*Less than 1,000 tonnes landed.

APPENDIX 6

International Council for the Exploration of the Sea (ICES) Statistical Areas.



APPENDIX 7

Expenditure on Fisheries for the years ended 31 December 1986 and 31 December 1985

	1 Jan.—31 Dec. 1986	1 Jan.—31 Dec. 1985
	(IR£)	(IR£)
1. SEA FISHERIES		
A. By Department of Tourism, Fisheries and Forestry (Fisheries Division):		
(i) Research and Development	380,000	307,000
(ii) Fishery Harbours and other marine works	1,237,000	1,360,000
B. By An Bord Iascaigh Mhara		
(i) Administration and Current Development (grant in aid)	4,715,000	4,846,000
(ii) Capital Development (grant in aid)	1,814,000	2,032,000
(iii) Repayable Advances	2,225,000	3,172,000
(iv) Repayment of Advances written off	1,250,000	1,000,000
C. Roinn na Gaeltachta Grants for Marine Works	175,000	273,000
2. INLAND FISHERIES		
(i) Central and Regional Fisheries Boards	5,018,700	4,751,000
(ii) Payments to Local Authorities under Section 21 of 1980 Act	495,000	465,000
(iii) Payments to Regional Fisheries Boards under Sections 54 and 62 of the 1959 Act	17,000	19,000
(iv) Regional Fisheries Boards and Garda Síochána Reward Fund	40,000	35,000
(v) Foyle Fisheries Commission	130,000	142,000
(vi) Research and Development	70,000	70,000
(vii) Salmon Research Trust of Ireland Inc. (grand-in-aid)	70,000	70,000
3. DEPARTMENT OF TORUISM, FISHERIES AND FORESTRY		
General administrative expenses for Fisheries Division	2,715,000	2,706,000
Totals	20,351,000	21,248,000

APPENDIX 8

Fisheries Regions (names in capitals, boundaries in heavy line) and Fishery Districts.

APPENDIX 9

Reported catch of salmon by commercial gear in 1984, 1985 and 1986

REGION District	Number			Quantity (Kg.)		
	1986	1985	1984	1986	1985	1984
Eastern						
Dundalk	1,880	2,284	2,452	7,640	7,928	8,278
Drogheda	4,017	2,142	3,295	18,585	10,394	15,641
Dublin	369	186	77	1,403	729	231
Wexford	3,525	3,071	4,018	13,913	12,297	17,601
Total	9,791	7,683	9,842	41,541	31,348	41,751
Southern						
Waterford	72,892	62,938	31,196	224,029	191,219	97,990
Lismore	20,008	30,839	15,376	61,353	86,034	43,402
Total	92,900	93,777	46,572	285,382	277,253	141,392
South Western						
Cork	81,829	63,648	14,774	251,313	183,746	43,579
Kerry	96,192	49,975	31,123	297,810	148,597	91,569
Total	178,021	113,623	45,897	549,123	332,343	135,148
Shannon						
Limerick	6,383	12,372	5,557	21,795	37,761	17,182
Total	6,383	12,372	5,557	21,795	37,761	17,182
Western						
Galway	4,489	6,779	5,918	15,709	21,985	30,199
Connemara	5,819	5,542	6,607	18,751	17,092	26,972
Ballinakill	5,253	4,186	839	15,705	15,349	4,281
Total	15,561	16,507	13,364	50,165	54,426	61,452
North-Western						
Bangor	19,421	20,784	4,296	70,294	63,611	13,641
Ballina	28,808	44,955	20,995	94,938	143,850	58,173
Sligo	4,124	4,034	3,233	10,772	9,969	11,309
Total	52,353	69,773	28,524	176,004	217,430	83,123
Northern						
Ballyshannon	6,795	12,073	8,414	22,794	34,043	22,779
Letterkenny	157,765	133,309	95,013	441,416	456,416	299,708
Total	164,560	145,382	103,427	464,210	490,459	322,487
GRAND TOTAL	519,569	459,117	253,183	1,588,220	1,441,020	802,535
Value (£)				5,241,126	7,464,484	4,421,968

APPENDIX 10

Reported catch of salmon by rod and line in 1984, 1985 and 1986

REGION District	Number			Quantity (Kg.)		
	1986	1985	1984	1986	1985	1984
Eastern						
Dundalk	186	657	199	740	2,899	802
Drogheda	232	205	182	1,065	1,018	897
Dublin	300	224	153	1,140	819	694
Wexford	500	1,069	1,122	2,100	4,606	4,834
Total	1,218	2,155	1,656	5,045	9,342	7,227
Southern						
Waterford	1,539	1,850	377	6,916	7,386	1,521
Lismore	472	410	427	1,782	1,318	1,467
Total	2,011	2,260	804	8,698	8,704	2,988
South Western						
Cork	72	85	82	349	372	319
Kerry	772	849	1,086	3,187	3,028	4,254
Total	844	934	1,168	3,536	3,400	4,573
Shannon						
Limerick	889	763	239	3,179	2,272	1,030
Total	889	763	239	3,179	2,272	1,030
Western						
Galway	1,048	1,206	465	4,225	4,335	2,373
Connemara	1,674	254	320	3,441	968	1,306
Ballinakill	1,346	849	414	5,655	3,079	2,112
Total	4,068	2,309	1,199	13,321	8,382	5,791
North-Western						
Bangor	1,710	860	562	6,238	2,881	1,747
Ballina	2,253	2,401	1,285	6,593	7,123	4,189
Sligo	2,119	1,705	783	5,460	4,761	2,384
Total	6,082	4,966	2,630	18,291	14,765	8,320
Northern						
Ballyshannon	2,030	115	581	6,902	397	2,098
Letterkenny	2,292	1,778	1,536	7,793	4,902	4,221
Total	4,322	1,893	2,117	14,695	5,299	6,319
GRAND TOTAL	19,434	15,280	9,813	66,765	52,164	36,248
Value (£)				220,324	270,209	199,726

APPENDIX 11

Reported catch of sea trout by commercial gear in 1984, 1985 and 1986

REGION District	Number			Quantity (Kg.)		
	1986	1985	1984	1986	1985	1984
Eastern						
Dundalk	164	979	842	99	622	689
Drogheda	439	915	842	127	830	764
Dublin	3,618	3,111	6,009	3,306	2,845	6,289
Wexford	196	2,079	1,513	118	1,293	920
Total	4,417	7,084	9,206	3,650	5,590	8,662
Southern						
Waterford	1,879	0	290	468	0	279
Lismore	492	0	359	126	0	347
Total	2,371	0	649	594	0	626
South Western						
Cork	355	202	300	771	416	615
Kerry	165	111	3,101	140	110	1,834
Total	520	313	3,401	911	526	2,449
Shannon						
Limerick	0	301	1,643	0	273	544
Total	0	301	1,643	0	273	544
Western						
Galway	6	0	0	3	0	0
Connemara	120	350	20	327	878	18
Ballinakill	320	743	550	171	675	499
Total	446	1,093	570	501	1,553	517
North-Western						
Bangor	150	0	0	105	0	0
Ballina	563	205	49	228	182	17
Sligo	2	0	40	6	0	60
Total	715	205	89	339	182	77
Northern						
Ballyshannon	346	1,303	3,115	176	678	2,031
Letterkenny	424	238	1,068	261	187	769
Total	770	1,541	4,183	437	865	2,800
GRAND TOTAL	9,239	10,537	19,741	6,432	8,989	15,675
Value (£)				21,226	46,563	86,369

APPENDIX 12

Reported catch of sea trout by rod and line in 1984, 1985 and 1986

REGION District	Number			Quantity (Kg.)		
	1986	1985	1984	1986	1985	1984
Eastern						
Dundalk	200	2,269	1,830	240	1,093	1,079
Drogheda	407	805	1,117	222	311	476
Dublin	0	200	85	0	108	47
Wexford	50	0	1,656	30	0	511
Total	657	3,274	4,688	492	1,512	2,113
Southern						
Waterford	41	0	102	36	0	46
Lismore	39	0	0	21	0	0
Total	80	0	102	57	0	46
South Western						
Cork	500	0	0	200	0	0
Kerry	600	34	399	240	20	248
Total	1,100	34	399	440	20	248
Shannon						
Limerick	166	0	0	132	0	0
Total	166	0	0	132	0	0
Western						
Galway	250	423	0	113	148	0
Connemara	13,086	12,859	6,963	9,853	6,780	3,569
Ballinakill	3,522	6,907	2,935	1,452	2,669	1,225
Total	16,858	20,189	9,898	11,418	9,597	4,794
North-Western						
Bangor	3,896	2,413	1,554	1,319	932	705
Ballina	250	0	381	125	0	181
Sligo	153	136	130	462	122	74
Total	4,299	2,549	2,065	1,906	1,054	960
Northern						
Ballyshannon	14	75	38	9	33	17
Letterkenny	1,595	2,704	1,688	888	1,069	666
Total	1,609	2,779	1,726	897	1,102	683
GRAND TOTAL	24,769	28,825	18,878	15,342	13,285	8,844
Value (£)				50,629	68,816	48,730

APPENDIX 13

Quantity and Value of Salmon and Sea Trout taken in 1984, 1985 and 1986 by Instruments of Capture

SALMON

Instruments	Quantity (kg)			Value (IR£)		
	1986	1985	1984	1986	1985	1984
Total for rod and line	66,765	52,164	36,248	220,324	270,209	199,726
Total for drift nets	1,397,577	1,266,983	624,947	4,612,004	6,562,972	3,437,211
Total for draft nets	145,470	131,365	130,025	480,051	680,470	715,140
Total for stake nets, weirs etc.	45,173	42,672	47,563	149,071	221,041	261,599
Total for all engines	1,654,985	1,493,184	838,783	5,461,451	7,734,692	4,613,316

SEA TROUT

Instruments	Quantity (kg)			Value (IR£)		
	1986	1985	1984	1986	1985	1984
Total for rod and line	15,342	13,285	8,844	50,629	43,840	35,113
Total for drift nets	2,749	2,472	5,873	9,072	8,157	23,316
Total for draft nets	3,383	6,507	9,474	11,164	21,473	37,611
Total for stake nets, weirs etc.	300	10	328	990	33	1,302
Total for all engines	21,775	22,274	24,519	71,854	73,503	97,342

APPENDIX 14

Reported catch of eels in 1984, 1985 and 1986

REGION District	Number			Quantity (Kg.)		
	1986	1985	1984	1986	1985	1984
Eastern						
Dundalk	873	1,064	946	1,955	2,437	2,517
Drogheda	535	0	304	1,004	0	473
Dublin	0	0	1,360	0	0	2,000
Wexford	2,486	4,117	2,814	6,627	11,568	7,274
Total	3,894	5,181	5,424	9,586	14,005	12,264
Southern						
Waterford	749	1,054	2,120	1,678	82,911	6,011
Total	749	1,054	2,120	1,678	82,911	6,011
South Western						
Cork	1,588	256	0	4,335	677	0
Kerry	0	0	1	0	0	3
Total	1,588	256	1	4,335	677	3
Shannon						
Limerick	49,687	44,853	41,546	201,419	184,479	159,706
Total	49,687	44,853	41,546	201,419	184,479	159,706
Western						
Galway	22,354	19,852	23,664	73,364	57,574	61,659
Total	22,354	19,852	23,664	73,364	57,574	61,659
North-Western						
Bangor	359	375	0	750	476	0
Ballina	5,000	6,083	3,069	16,410	12,499	4,676
Sligo	0	103	771	0	343	1,500
Total	5,359	6,561	3,840	17,160	13,318	6,176
Northern						
Ballyshannon	3,057	9,490	11,985	7,267	17,584	10,305
Letterkenny	10	54	127	11	957	192
Total	3,067	9,544	12,112	7,278	18,541	10,497
GRAND TOTAL	86,698	87,301	88,707	314,819	371,505	256,316

APPENDIX 15
Numbers of salmon and trout produced at hatcheries 1985/86

Hatchery	Ova produced during 1985/6 season (thousands)	Particulars of hatchery produce stocked out in 1986 (thousands)	
		Numbers stocked	River systems
Virginia	158	30 Salmon fingerlings 29 Salmon fingerlings 5 Salmon fingerlings 3 Salmon parr 2 Salmon parr	Kells Blackwater Dee Fane Moynalty Fane
Islandbridge	70	25 Salmon fingerlings	Liffey
Inistioge		94 Unfed salmon fry 180 Unfed salmon fry 94 Unfed salmon fry	Barrow Nore Suir
Mallow Carrigadroichead	90	554 Unfed salmon fry 61 Salmon smolts	Blackwater Lee
Parteen	1,086	72 Salmon fry 500 Salmon fingerlings 84 Salmon pre smolts 120 Salmon smolts	Mulcair Shannon ,, ,,
Fanure	740	20 Eyed trout ova 329 Trout summerlings 262 Trout fingerlings 101 Trout spring yearlings 2 Trout autumn yearlings 38 Trout two year olds 1 Trout adult	Various Central and Regional Fisheries Boards waters and Angling Club waters throughout the country.
Cullion	1,800	9 Eyed trout ova 970 Trout fry 55 Trout summerlings 148 Trout fingerlings 190 Trout spring yearlings 4 Trout autumn yearlings 21 Trout two year olds	Various Central and Regional Fisheries Boards waters and Angling Club waters throughout the country.
Oughterard	300	250 Unfed trout fry	Corrib
Cong	600	150 Salmon eyed ova 10 Salmon smolts 20 Salmon parr 9 Salmon smolts 14 Salmon parr	Corrib ,, ,, Errif
Screebe		50 Unfed sea trout fry 10 Unfed sea trout parr 10 Salmon smolts	Screebe Screebe Screebe
Salmon Research Trust	445	15 Salmon ova 100 Salmon ova 100 Salmon ova 170 Salmon ova 60 Salmon ova 10 Salmon parr	Fergus Barrow, Nore & Suir Rivers in Donegal Rivers in Donegal Rivers in Kerry Burrishoole
Carrowmore Lake	48	41 Eyed salmon ova	Altnabrocky
Erne	532	39 Salmon smolts 125 Salmon fingerlings 10 Brown trout fingerlings 6 Sea-trout fingerlings	Erne ,, ,,
Glenties		140 Salmon ova 10 ,, ,, 5 ,, ,, 10 ,, ,, 20 Salmon fry 20 ,, ,,	Owenea Owentocker Swilly Lackagh Crana Donagh

APPENDIX 16

Particulars of receipts and expenditure by the Central and Regional Fisheries Boards for the year ended 31st December, 1986

Board	Opening Balance IR£	Receipts					
		Licence Duty IR£	Fishery Rates IR£	Sale of Fish IR£	Exchequer Grants IR£	Misc. Receipts IR£	Total Receipts IR£
Central	−21,539	—	—	149,857	1,384,500	169,454	1,703,811
Eastern	+709	60,265	11,969	528	495,850	42,809	611,421
Southern	−10,665	57,733	17,811	—	428,000	46,575	550,119
South-Western	−14,443	81,695	11,277	10,082	585,500	24,495	713,049
Shannon	+4,923	38,337	10,584	1,005	340,000	47,908	437,834
Western	−28,443	45,220	39,500	18,341	666,550	70,315	839,926
North-Western	−7,441	49,094	38,819	7,060	543,600	38,709	677,282
Northern	+3,876	60,763	19,751	1,357	573,700	63,067	718,638
Total	−73,023	393,107	149,711	188,230	5,017,700	503,332	6,252,080

Board	Expenditure					
	Salaries Wages IR£	Travelling and Subsistence IR£	Purchases of Vehicles Boats & Equipment Ir£	Misc. Expenditure IR£	Total Expenditure IR£	Closing Balance IR£
Central	1,260,474	58,232	39,500	370,990	1,729,196	−46,924
Eastern	413,908	55,083	18,464	156,366	643,821	−31,691
Southern	375,028	28,894	14,056	160,589	578,567	−39,113
South-Western	462,030	28,133	88,597	141,135	719,895	−21,289
Shannon	243,082	10,547	98,669	106,068	458,366	−15,608
Western	527,666	15,170	49,964	240,353	833,113	−21,630
North-Western	451,223	11,893	47,237	173,009	683,362	−13,521
Northern	496,456	24,067	47,382	167,436	735,341	−12,827
Total	4,229,827	232,019	403,869	1,515,946	6,381,661	−202,603

APPENDIX No. 17

Particulars of licences sold by Regional Fisheries Boards for salmon, eel and oyster fishing for 1986

CODE		A	O	R	B	P	S	T		C	D	U	E	F	G	H	I	J	K	L	M	V	N
		Annual: all Districts	Late season: all Districts	Seven day: all Districts	Annual: District of Issue	Late Season: District of Issue	Foyle Extension: all Districts	Foyle Extension: District of Issue	Special Local: Rod	Special Local: Draft Net	Draft Net	Dirft Net	Pole Net	Bag Net	Stake Net	Head Weir	Box or Crib	Loop Net	Snap Net	Gap, Eye or Basket (eels)	Long Line For Eels	Eel Trap	Fyke Net (eels)	Oyster Dredge
DUTY		IR£ 17	IR£ 11.50	IR£ 6	IR£ 8	IR£ 6	IR£ 11.50	IR£ 5	IR£ 8	IR£ 101	IR£ 75	IR£ 132	IR£ 11.50	IR£ 75	IR£ 132	IR£ 25	IR£ 51	IR£ 5	IR£ 30	IR£ 34.50	IR£ 34.50	IR£ 57.50	IR£ 34.50	IR£ 34.50
Eastern		1,271	116	47	1,323	445	1	—	—	—	176	16	—	—	—	—	6	—	—	—	13	1	—	—
Southern		276	7	339	1,781	166	—	—	—	—	9	225	—	1	1	1	2	—	126	8	—	1	9	—
South-Western		338	44	285	1,082	242	—	—	—	—	88	131	—	—	—	—	1	—	—	—	—	—	2	57
Shannon		211	33	20	1,169	115	—	—	—	—	91	79	—	—	—	—	—	—	—	97	4	—	3	—
Western		263	169	745	670	815	—	—	—	—	22	7	—	—	—	—	5	—	—	34	9	3	17	131
North-Western		319	121	358	1,403	839	—	—	—	25	15	121	—	1	—	—	7	—	—	25	5	2	—	115
Northern		338	83	205	1,075	882	8	53	309	17	106	189	—	—	—	—	2	30	—	6	29	4	1	—
TOTAL		3,016	573	1,999	8,503	3,504	9	53	309	42	507	768	—	2	1	1	23	30	126	170	60	11	32	303

APPENDIX 18

Statutory Instruments and other regulations — 1986

Herring

Herring (Revocation) Order (S.I. No. 1, 1986).
Licensing of fishing in Celtic Sea.

Irish Sea Herring Fishing Order (S.I. No 258, 1986).
Licensing of fishing in Irish Sea.

Herring (Prohibition in Irish Sea) Order (S.I. No. 301, 1986).
Closure of Irish Sea Fishery from 7th September 1986.

Celtic Sea (Revocation) Order (S.I. No. 322, 1986).
Revocation of closed periods in Celtic Sea.

Herring (Restriction of Fishing) Order (S.I. No. 359, 1986).
Closure of fishery in west and northwest region from 11th November.

Herring (Amendment) Order (S.I. No. 407, 1986).
Opening of fishery in northwest region from 9th December.

Demersal fish

Sole (Revocation) Order (S.I. No. 29, 1986).
Opening of sole fishery in Irish Sea.

Hake Order (S.I. No. 380, 1986).
Closure of hake fishery from 28th November to end of 1986.

Fishing by foreign vessels

Sea Fisheries (Conservation and Management) Order (S.I. No. 52, 1986).
Extends EEC regulations to Spanish and Portuguese vessels.

Sea Fisheries (Conservation and Management) Order (S.I. No. 53, 1986).
Extends EEC regulations to Swedish, Norweigan and Faroese vessels.

Sea Fishing Boats Regulations (S.I. No. 289, 1986).
Crewing requirements for UK vessels operating in Irish waters.

Sea Fisheries (Amendment) Order (S.I. No. 456, 1986)
Extends EEC regulations to Spanish, Portuguese, Norweigan, Swedish and Faroese vessels.

Fish processing vessels

Fisheries (Control of Fish Processing Vessels) Order (S.I. No. 28 of 1986)

Confers powers of inspection by Protection Officers Fisheries (Control of Fish Processing Vessels) Order (S.I. No. 253, 1986).

Licence requirements for fishing by processing vessels.

Logbooks

Sea Fisheries (Control of Catches, Amendment) Order (S.I. No. 56, 1986).

Extends logbook system to transhipping operations.

Quotas

Sea Fishing (European Community Quotas) Order (S.I. No. 57, 1986).

Enforcement of EEC quotas.

Salmon and trout

Northern Fisheries Region (River Erne) Bye-Law 652, 1986.

Curtails open season for salmon netting in 1986.

River Erne (Special Local Licences) (Amendment) Order, (S.I. 212, 1986.)

Provides special local licence duty for draft nets.

Salmon and Trout Conservation Bye-Law 653, 1986.

Extends open season for commercial fishing, except drift netting.

Salmon Net Mesh Size (Revocation) Bye-Law 655, 1986.

Revokes Bye-Laws permitting use of small mesh size in salmon nets.

Shannon Fisheries Region (Close Season for Trout) Bye-Law CS 129, 1986.

Extends open season for trout in major lakes of Shannon Region.

Pike

Conservation of Pike Bye-Law 654, 1986.

Imposes bag limit of three pike per person and possession limit of ten per person.

Regional Boards

Elections to Regional Fisheries Boards (Amendment) Regulations, 1986 (S.I. No. 352, 1986.)

Sets out provisions for nominations where the electorate numbers less than five.

Designation of named areas for aquaculture

Acquaculture (Killary Harbour) Order (S.I. No. 87, 1986).

Acquaculture (Bertraghboy Bay) Order (S.I. No. 395, 1986).

Aquaculture (Kilkieran Bay) Order (S.I. No. 396, 1986).

Aquaculture (Mulroy Bay) Order (S.I. 397, 1986).

Aquaculture (Carlingford Lough) Order (S.I. No. 398, 1986).

Aquaculture (Ventry Harbour and Trabeg Bay) Order (S.I. No. 399, 1986).

Acquaculture (Ballynakill) Order (S.I. No. 400, 1986).

Acquaculture (Clew Bay) Order, 1986 (S.I. No. 401, 1986).

Acquaculture (Clifden Bay, Mannin Bay) Order, 1986 (S.I. No. 402, 1986).

APPENDIX 19

FOYLE FISHERIES COMMISSION REGULATIONS, 1986

Foyle Area (Control of Netting) (Amendment) Regulations, 1986
Delayed further until 1 June, 1987 the coming into operation of additional restrictions on the materials which may be used in the construction of commercial fishing nets for the capture of salmon and trout.

Foyle Area (Control of Netting) (Amendment No. 2) Regulations, 1986
Alters the prohibition on fishing by drift net for salmon and trout during the daytime.

Foyle Area (Weekly Close Times) (Amendment) Regulations, 1986
Alters the weekly close time for commercial fishing for salmon and trout.

Foyle Area (Licensing of Fishing Engines) (Amendment) Regulations, 1986
Increases the licence fees payable in the Foyle Area during 1986.

APPENDIX 20

Position regarding designation of areas for aquaculture at end of 1986.

Date of Inquiry	Area under consideration	Decision on report of inquiry
10/4/84	Inner Bantry Bay, Co. Cork	Under consideration
1/5/84	Achill Sound, Bellacragher Bay, Co. Mayo	Order made
2/5/84	Blacksod/Broadhaven, Co. Mayo	Order made
2/5/84	Cork Harbour, Co. Cork	Under consideration
22/5/84	Rogerstown	Decision taken not to proceed with the making of the order
29/5/84	Kenmare River, Co. Kerry	Under consideration
12/6/84	Killary Harbour, Co. Galway/Mayo	Order made
26/6/84	Carlingford, Co. Louth	Order made
10/7/84	Wexford Harbour, Co. Wexford	Under consideration
27/5/86	Mulroy Bay, Co. Donegal	Order made
29/5/86	Gweebara, Co. Donegal	Under consideration
10/6/86	Kilkieran Bay, Co. Galway	Order made
12/6/86	Bertraghboy Bay, Co. Galway	Order made
24/6/86	Mannin Bay, Streamstown, Co. Galway	Order made
26/6/86	Ballinalkill area, Co. Galway	Order made
19/8/86	Cruit Island area, Co. Donegal	Under consideration
20/8/86	Inver Bay/McSwyne's Bay, Co. Donegal	Under consideration
22/9/86	Clew Bay, Co. Mayo	Order made
4/9/86	Clare Island, Co. Mayo	Under consideration
8/9/86	Valentia, Co. Kerry	Under consideration
16/9/86	Smerwick Harbour, Co. Kerry	Under consideration
17/9/86	Ventry & Trabeg Bay, Co. Kerry	Order made

Note: Decision taken not to designate Dingle Harbour.

APPENDIX 21

Common Fisheries Policy quotas and total allowable catch (TAC) in tonnes, as agreed by Committee of Ministers, 17/18 December 1986.

Species	ICES Area	1986 Quota (Tonnes)	TAC (Community share tonnes)
Megrim	VI	570	4,400
	VII	2,390	14,400
	Total	2,960	18,840
Plaice	VI	660	1,810
	VIIa	2,000	5,000
	VIIb, c	160	200
	VIIf, g	125	1,800
	VIIh, j, k	350	800
	Total	3,245	6,610
Sole	VI	55	70
	VIIa	230	1,900
	VIIb, c	50	60
	VIIf, g	45	1,500
	VIIh, j, k	270	600
	Total	650	4,130
Cod	VI	3,090	25,000
	VII (except VIIa)	1,630	16,000
	VIIa	7,000	15,000
	Total	10,720	56,000
Haddock	VI	2,720	34,500
	VII	1,330	6,000
	Total	4,050	40,500
Hake	VI, VII	1,550	25,190
Saithe	VI	670	27,800
	VII	2,530	9,000
	Total	3,200	36,800
Whiting	VI	4,900	16,400
	VII (except VIIa)	5,700	20,500
	VIIa	7,200	18,170
	Total	17,800	55,070
Pollock	VI	10	715
	VII	50	8,670
	Total	60	9,385
Monkfish	VI	780	7,820
	VII	2,280	30,070
	Total	3,060	37,890
Herring	VIa N	6,980	46,200
	VIa S, VIIb, c	15,450	17,000
	VIIa	1,640	6,300
	VIIg, h, j, k (Celtic Sea)	14,870	17,200
	Total	38,940	96,700
Mackerel	VI, VII	71,250	334,000
Nephrops	VI	200	14,800
	VII	9,100	24,700
	Total	9,300	39,500

APPENDIX 22

Scientific Publications

Departmental

Irish Fisheries Investigations Series A (Freshwater)

24. J. P. O'Connor and E. J. Wise	Observations on the Trichoptera of the Killarney Lakes, Co. Kerry, Ireland

Fishery Leaflets

131 P. Gallagher	Results of magnetic tag recovery programme in the Mayo area in 1985.
132 E. Fahey	Fish kills in Ireland in 1985.
133 E. Barnwall	The fat content of Irish mackerel during 1984/85 and 1985/86.
134 E. Fahy	The sea trout year 1985.
135 J. Browne and P. Gallagher	Population estimates of juvenile salmon in the Corrib System from 1982 to 1984.

Conference papers and other publications

J. Browne	Atlantic salmon — planning for the future. Proceedings 3rd International Salmon Symposium, Biarritz.
J. Browne	Use of coded wire tags to assess the relative performance of wild and reared salmon smolts. Institute of Fisheries Management, 17th Annual Study Course, Coleraine, Proceedings.
E. Fahy	The shrinking salmon. Atlantic Salmon Journal 36, 11-12.
E. Fahy	Dynamics of *dynotrutta*. Salmon and Trout Magazine, 232, 63-65.
E. Fahy	Tip of the iceberg; fish kills in Ireland. Irish Journal of Environmental Science, 3, 31-33.
R. J. Grainger and S. McLoughlin	A portable computerised system for logging of fish sample data. ICES CM 1986 G:59.
S. Martin and E. Fahy	Food and growth of cyprinids in a Co. Dublin reservoir. Irish Naturalists' Journal 22, 107-110.
D. Minchin and C. B. Duggan	Organotion contamination in Irish waters ICES CM 1986 F:48.
D. Minchin and C. B. Duggan	The distribution of the exotic ascidian *Styela clava* Herdman in Cork Harbour. Irish Marine Sciences Association, Galway.
C. Moriarty	Riverine migration of young eels *Anguilla anguilla* (L.) Fisheries Research, 4, 43-58.
C. Moriarty	The European eel — discoveries and developments. Institute of Fisheries Management 17th Annual Study Course, Coleraine, Proceedings.
C. Moriarty	Variations in elver abundance at European catching stations from 1938 to 1985. Vie Milieu 36, 233-235.

C. Moriarty	Observations on the eels of Meelick Bay, Lough Derg, 1981-1984. Vie Milieu 36, 279-283.
M. P. O'Sullivan, D. McLoughlin, E. Nixon and M. G. O'Sullivan	Environmental monitoring of an industrial waste dumpsite at sea off the south coast of Cork. ICES CM 1986 E:43.
E. C. E. Potter, D. G. Reddin and J. Browne	Recoveries of coded wire microtags from salmon (*Salmo salar* L.) caught at West Greenland in 1985. ICES CM M:7

Wt. 162601. 700. 4/89. Cahill. (3006). G.30-03.